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MICROGRAPHS



U.S.
DEPARTMENT
OF
COMMERCE
Domestic and
International
Business
Administration



MICROGRAPHICS

A Survey Covering 13 Primary Markets



U.S. DEPARTMENT OF COMMERCE

Frederick B. Dent, Secretary

DOMESTIC AND INTERNATIONAL BUSINESS ADMINISTRATION

BUREAU OF INTERNATIONAL COMMERCE

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CONTENTS

	Page
Global Marketing Strategy for the 1970's	1
I. Summary—Growth Markets for Micrographics Equipment and Supplies	3
II. Export Market Digests—Country Markets	7
Australia	9
Belgium	17
Canada	23
Denmark	31
France	38
Germany	44
Italy	52
Japan	59
Netherlands	66
Spain	72
Sweden	79
Switzerland	85
United Kingdom	92
III. Supplementary Information for U.S. Exporters	100
Financing Export Sales (Export-Import Bank of the United States)	
Export Credit Insurance (FCIA)	101
Tax Benefit Program for U.S. Exporters (DISC)	103
Commerce Contacts for U.S. Business	104
IV. Schedule of Events	
Promotional Events Schedule—1973	107
Promotional Events Schedule—1974	110
Promotional Events Schedule—1975	113



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Global Marketing Strategy for the 1970's

A Cooperative Endeavor

- Both in concept and implementation, an effective U.S. export expansion program for the 1970's requires a joint undertaking by industry and government. Such a cooperative endeavor, aimed at worldwide market penetrations, involves a medium-to-long term effort between government and specific U. S. industries having the highest potential for sustained growth in exports.
- The Department of Commerce's Bureau of International Commerce (BIC), has the primary responsibility for the government to work with industry to formulate and implement global marketing actions.

Key Features of the Strategy

- Comprehensive, Global Market Surveys to pinpoint the best foreign markets for selected U.S. product categories.
- A nationwide campaign, with Commerce Department Field Office account executives encouraging U.S. manufacturers to participate in a cooperative export expansion program and assisting them in establishing their own global marketing plan.
- Professional counseling for U.S. firms on export sales techniques and opportunities in target markets.
- Scheduled overseas trade promotion activities on a year-round basis to provide U.S. companies direct marketing access to and sales expansion in target markets abroad.

Product Selection

- Selection of product categories to receive "target" treatment is based upon analysis, by the Department, of export-expandable lines. Concurrent discussions with U.S. industry establish priorities and determine the interest of individual firms in undertaking an export program.
- Generally these product categories represent industries in which the United States has technological or other advantages over foreign competition.
- Global Market Surveys already published or scheduled for publication in the remainder of the current fiscal year are:

Electronic Data Processing Equipment (1970)
Food Processing & Packaging Equipment (1971)

Pumps, Valves and Compressors (1972)
Industrial & Scientific Instruments (1972)
Air Conditioning & Refrigeration Equipment (1972)
Agricultural Machinery & Equipment (1973)
Micrographics Equipment and Supplies (1973)
Biomedical Equipment (1973)
Computers & Computer Related Equipment (1973)
Materials Handling Equipment & Systems (1973)
Production and Test Equipment for the Electronics Industry (1973)

Tooling Up for World Market Research

The Bureau of International Commerce develops, with industry assistance, a marketing-oriented definition of the product category, determines the market research requirements, and identifies the country markets to be examined. The research is structured to verify the existence and viability of foreign markets for specific products. Parameters of the market research cover:

- Size of the country market.
- Market trends and developments in the use and application of equipment within the product category.
- Prospects for U.S. exports of the product category in general and the specific types of equipment that appear to have particularly promising sales potential for U.S. suppliers.
- Market characteristics and data that will assist U.S. firms in conducting business in the country market.
- Identification of promotional activities: Major trade exhibitions, seminars, congresses, and trade missions scheduled for the next 2 years in this field.

Target Industry Research Strategy

- Market research in each target country is conducted in strict accordance with rigid specifications through contracting with U.S. or overseas firms or by utilizing Commerce or U.S. Foreign Service staffs.
- Heavy emphasis in the research is placed upon individual interviews, deemed especially important in estimating market trends.
- The Global Market Survey is then prepared, based on the information obtained in the market research

as well as from other sources. Each Survey is designed to provide U.S. industry executives with: An overview of worldwide performance of the selected product category; summaries of each country researched under the program; Commerce services and assistance to U.S. business to facilitate foreign market penetration.

Export Promotion Abroad

- The best trade promotion events related to the product category for each country are listed in each Global Market Survey in the "Schedule of Events" section.

Identification of American Firms

- All identifiable U.S. manufacturers, distributors, exporters, and industry organizations concerned with the selected product category are listed in a Commerce master file.
- All firms identified are encouraged to participate in the global marketing strategy calculated to expand their export sales.

The Action Program

- International Trade Specialists of the 43 Department of Commerce Field Offices meet with officials of prospective participants to discuss marketing strategy.

- The ultimate aim is to assist each firm in the development of an individual global marketing plan tailored to the specific needs and export capabilities of that particular company. The plan is a business/government cooperative effort to increase exports or launch new export operations.
- A representative of the appropriate Department of Commerce field office will work with each participating firm as its "account executive" throughout the campaign.
- All U.S. firms engaged in the manufacture or sale of products in the target industry are encouraged to participate in the action program.

Further Details

- Additional information may be obtained from the Domestic Field Programs Division, Office of Export Development, Bureau of International Commerce (264) U.S. Department of Commerce, Washington, D.C. 20230, or from any one of the Department's 43 field offices.
- Copies of the Global Market Survey are available from the Department's field offices or from the National Technical Information Service, Springfield, Virginia 22151. Prices vary.

I. Summary—Growth Markets for Micrographics Equipment and Supplies

The paperwork "explosion" occurring around the world, particularly in the industrialized countries, offers the U.S. micrographics industry steadily expanding markets. Critical needs exist in the developed countries for new techniques, systems, and methodologies to cope with mounting information storage and retrieval problems. Throughout the world there is a dearth of knowledge of the advancements in micrographics technology and their application to improving and increasing the efficiency of business operations.

In industrialized countries, however, the utilization of micrographics technology already has streamlined operations in many business and government entities. But even these international markets have not yet fully matured, and further sales development is needed to capitalize on this vast untapped market potential. The position of the micrographics industry today appears similar to that of the U.S. computer industry a few years ago, when exploding technological developments were turned into U.S. domination of the world market through substantial efforts and early penetration of foreign markets. The U.S. micrographics

industry is similarly leading the world in advanced products and application know-how and is in an excellent position to develop growth business overseas.

The manufacture of micrographics equipment and supplies is one of the most rapidly expanding industries in the United States. According to the National Microfilm Association, the industry's average annual growth rate is 18%, with annual sales expected to exceed \$1 billion in 1975. Increased exports are expected to play an important part in this growth as U.S. firms seek new and expanded business overseas.

U.S. Department of Commerce market surveys recently conducted in 13 countries—comprising the world's most promising growth markets—reveal unprecedented export opportunities for U.S. manufacturers of micrographics equipment and supplies. The findings of these surveys in each country are detailed in the text following.

Survey Highlights

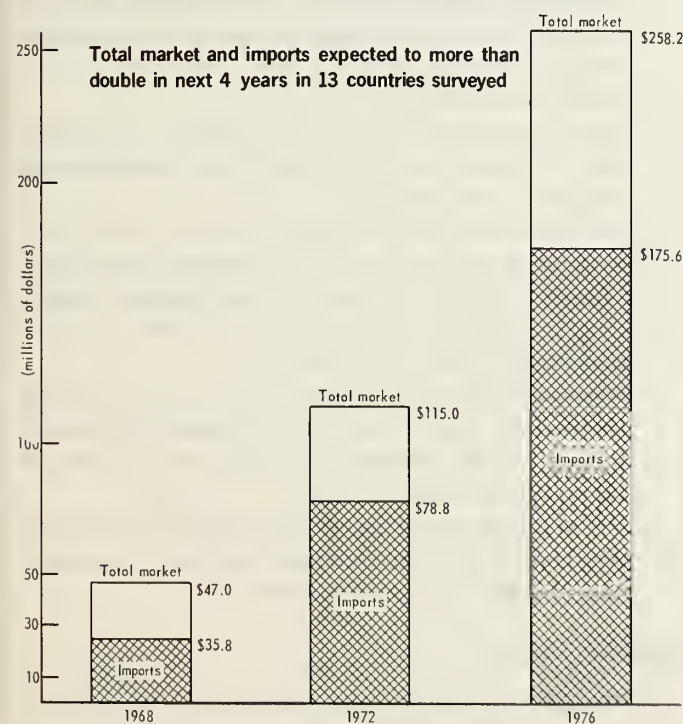
- The total market for micrographics equipment and supplies is predicted to grow from \$115 million in 1972 to over \$258 million in 1976 (see figure 1).
- Total imports of the product category are projected to rise at an average annual rate of 21%, from \$66.7 million in 1971 to \$175 million in 1976.
- In 1971, U.S. sales of micrographics equipment and supplies to the 13 countries surveyed amounted to \$45.5 million, or 67% of their combined micrographics import markets.

Typical of the untapped markets for micrographics, as revealed by the survey, is that in the United Kingdom. All major banks in England use microfilm for passive systems to record and store information. While practically all bank transactions are microfilmed, only two banks in the country utilize computer-output-microfilm (COM) units. The Commerce Department survey indicated, however, that an increase in sales of COM units to British banks is conservatively expected to reach a total of 25 to 30 units by 1976.

In the case of Germany, the market survey further reveals that there are at least 100 banks of sufficient size and with a correspondingly large customer base to justify in-house COM systems. An additional 250 banks are potential users of active microfilm systems. However, to date only one bank in Germany has a COM system.

As in the United States, governments in each country

Figure 1
Micrographics Equipment and Supplies



surveyed are major micrographics users, in addition to the business and industrial sectors (see figure 2). Usually, the national government agencies are the major end-users, with state/provincial governments next and municipalities ranking third. The government sector accounts for at least 20% of the micrographics market in most countries surveyed. With the introduction of new micrographics systems and increased familiarity with existing equipment, the government sectors become prime sales prospects for U.S. manufacturers. For example, in Denmark, where the government sector accounts for 30% of the micrographics market, sales of micrographics products to government are expected to increase at any average yearly rate of 35 to 45% between 1972 and 1976.

The United States is the world's leading manufacturer of micrographics equipment and supplies and this is reflected in the U.S. share of imports in the countries surveyed. In all these countries the U.S. share of imports is at least 50%, and in Canada and Japan it ranges as high as 95%.

The largest single foreign market for micrographics products is Germany, where demand reached \$22.5 million in 1971 and is expected to expand to nearly \$84 million by 1976 (see table 1). Germany, like all other countries surveyed, relies on imports to supply a major percentage of its demand and is expected to continue to be the largest importing country, with total annual imports growing to about \$54 million in 1976 (see table 2).

The United Kingdom, the second largest foreign market, totaled \$18 million in 1971 with imports at \$9.5 million. By 1976 the U.K. market is expected to exceed \$45 mil-

lion annually, with imports furnishing an estimated 50 to 60% of the demand.

The third largest foreign market is neighboring Canada, which totaled \$14 million in 1971 and is expected to exceed \$28 million by 1976. With virtually all micrographics equipment and supplies imported and the United States supplying more than 90% of these imports, Canada will continue to be a significant U.S. growth market.

Legal Status of Microfilm

Although microfilm documentation does not have legal status in many foreign countries, the lack of such status has not been a significant inhibiting factor in the promotion and sale of micrographics equipment. Micrographics trade and user associations and individual firms abroad are promoting legislation that would make microfilm admissible as evidence in courts of law in their respective countries. As successive countries enact legislation, the market for micrographics equipment should expand even faster than its present rate.

Factors Favoring the Expansion of U.S. Exports

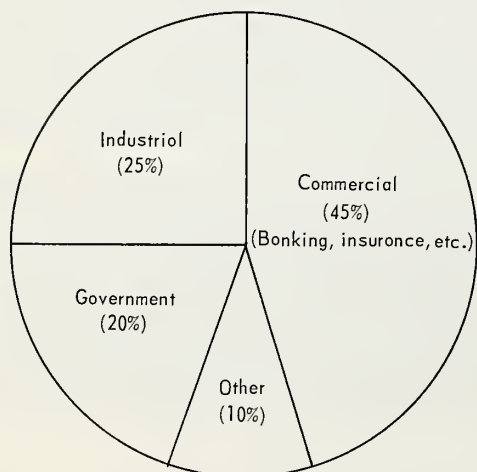
- The overseas markets for micrographics equipment and supplies are expanding rapidly and will more than double in the next 4 years.
- U.S. firms are world leaders in advancing micrographics technology. This ability gives American manufacturers decided sales advantages in the world marketplace.
- The need to overcome the paperwork explosion has caused governments and private enterprise throughout the world to seek improved and more automated methods of record keeping, data retrieval and information dissemination.
- New applications of U.S. micrographics technology offer a tremendous world market for micrographics equipment and supplies.
- U.S. micrographics equipment manufacturers will continue to lead the world in design and technology, offering the broadest array of micrographic equipment and supplies. U.S. firms are in a position to take advantage of this fertile market.
- Mass-production techniques, coupled with associated economies of scale, have permitted many U.S. manufacturers to set competitive export prices in spite of relatively higher labor costs.
- U.S. suppliers are in the best position to be first in the marketplace with new products and thus to establish lead positions in foreign markets.

Inhibiting Factors

- Intensive training of sales personnel is necessary to carry out an expanded sales program.
- In some countries there may be resistance to change from conventional business procedures.

Figure 2

**Typical sales distribution
by market sector
in 13 countries surveyed**



- A lack of manufacturers' and users' standards in some instances has brought about an incompatibility between micrographics systems.

Conclusions

The overseas market for micrographics equipment and supplies is rapidly developing. Its predicted growth rate for the 1970's offers unprecedented opportunities for U.S. firms. American micrographics products hold the major share of the foreign market as a result of their manufacturing and technological leadership. The present U.S. lead in time and technology is one that U.S. firms should take advantage of by early entry and establishment of their position in the market place. Growth of the market is par-

tially dependent upon the development of latent sales opportunities. However, a need exists for the promotion of micrographics products by more U.S. firms to take full advantage of these growth markets. This is particularly true of sales of innovative and advanced equipment used in active applications. Sales opportunities for U.S. suppliers are immediate and are increasing rapidly.

U.S. micrographics firms are encouraged to enter the foreign market now to establish their position and to obtain greatest results from long-range sales growth. U.S. firms known to be micrographic products manufacturers will be contacted by a Commerce Department representative with the view to discussing special Commerce assistance available in developing or expanding each company's overseas markets.

Table 1

MICROGRAPHICS EQUIPMENT AND SUPPLIES

Market Size by Country, 1971,¹ and
Forecasts for 1976
(in millions of dollars)

1971		1976	
Germany	22.5	Germany	83.7
United Kingdom	18.0	United Kingdom	45.4
Canada	14.0	Canada	28.4
Japan	8.9	Japan	24.7
France	7.7	France	16.5
Italy	4.7	Italy	12.4
Sweden	3.9	Sweden	10.9
Netherlands	3.7	Netherlands	8.7
Belgium	2.9	Switzerland	7.3
Switzerland	2.1	Denmark	6.2
Denmark	1.6	Belgium	4.9
Australia	1.6	Spain	4.7
Spain	1.2	Australia	4.4
Total	92.8	Total	258.2

¹ Values are based upon official country trade statistics, trade estimates, and U.S. Department of Commerce, Bureau of International Commerce (BIC) analyses.

Note: Market size is calculated upon the basis of production plus imports less exports.

Table 2

MICROGRAPHICS EQUIPMENT AND SUPPLIES

Country Imports, 1971,¹ and
Forecasts for 1976
(in millions of dollars)

1971		1976	
Germany	15.9	Germany	53.8
Canada	14.0	Canada	28.4
United Kingdom	9.5	United Kingdom	24.2
France	4.7	Sweden	10.9
Italy	4.0	Italy	10.8
Sweden	3.9	France	9.5
Netherlands	3.3	Netherlands	7.8
Belgium	2.7	Switzerland	7.3
Japan	2.5	Denmark	6.2
Switzerland	2.1	Spain	4.7
Denmark	1.5	Belgium	4.6
Australia	1.4	Japan	4.5
Spain	1.2	Australia	2.9
Total	66.7	Total	175.6

¹ Values are based upon official country trade statistics, trade estimates, and U.S. Department of Commerce, Bureau of International Commerce (BIC) analyses.

II. Export Market Digests

The following Export Market Digests are abstracts of market surveys conducted by the Department of Commerce. They pinpoint the best "sales potentials" in each of the respective markets.

Australia

As Australia continues its rapid industrialization and urbanization, the country is expected to turn increasingly to the use of micrographics to solve the paperwork problems that go with a developed economy.

Over the next 5 years, sales of micrographics products are expected to increase dramatically, almost tripling 1971 levels.

By 1976, the trend toward extensive micrographics usage should be well underway as government agencies, financial institutions, insurance companies, large manufacturers, and medical facilities begin to rely more heavily on microfilm technology to fulfill their information processing needs. A rapid rise in demand for imported micrographics products is expected, especially for systems-oriented equipment.

The United States, as the forerunner in the micrographics field, should continue to lead all foreign suppliers in the Australian market.

Highlights

▶ A strong surge in demand is predicted for the Australian market for micrographics equipment and supplies; sales are expected to nearly triple to \$4.5 million by 1976.

▶ Australia should continue to depend upon imports to satisfy the bulk of its growing needs for micrographics products during the next 5 years.

▶ Imports are predicted to grow over 15% annually and to approach \$3 million in 1976.

▶ U.S. suppliers now provide about two-thirds of Australia's imports of micrographics equipment.

▶ Restrictions on admissibility of microfilm as documentary evidence in court are expected to be removed soon, opening large sectors of the market to widespread use of micrographics equipment.

Market May Top \$4.4 Million by 1976

Strong, steady growth has characterized the micrographics market in Australia, and the forecast is for an even higher rate of growth in the next few years. Total sales of micrographics equipment and supplies more than doubled between 1968 and 1971, rising from \$701,000 to \$1.6 million (see table 1). The 5-year forecast shows the market for micrographics products expanding to a sales volume of over \$4.4 million by 1976, nearly tripling the present level.

Rapid growth also is predicted for the services segment of the Australian micrographics market. Aggregate revenues of local service bureaus are forecast to more than double the 1971 level of \$1.2 million by 1976.

Australian trade sources see the micrographics market entering a period of rapid change—new customers are entering the market; present users are expanding in-house operations; and large organizations are planning to buy centralized microfilm systems to solve their problems of recording, printing, and distributing vast amounts of information (see figure 1).

Australia has been, and will continue to be, dependent upon imports to satisfy its demand for micrographics equipment. By 1976, equipment purchases from abroad are expected to approach \$3 million, representing a twofold increase over the 1971 total of \$1.5 million.

The United States has been Australia's main supplier of micrographics products. In 1971, U.S. firms sold

\$910,000 worth of micrographics equipment and supplies in Australia, or 62% of the total import market. The closest competitor was the United Kingdom, which supplied \$307,000, a 21% share of imports. Following the United Kingdom were Germany with 7% of the import market and Japan with 5% (see table 2).

Specific Sales Opportunities

Australian demand for all types of micrographics products is increasing as present customers expand their usage and new markets are penetrated. Forecasts indicate that Australia will spend about \$10 million for imported micrographics equipment and supplies over the next 5 years.

An extensive market research study recently conducted in Australia for the U.S. Department of Commerce reveals highly favorable prospects for American exporters of the following micrographics products:

- Portable cameras
- Planetary cameras
- Rotary cameras
- Roll film readers
- Microfiche readers
- Roll film reader/printers
- Microfiche reader/printers
- Automatic retrieval devices

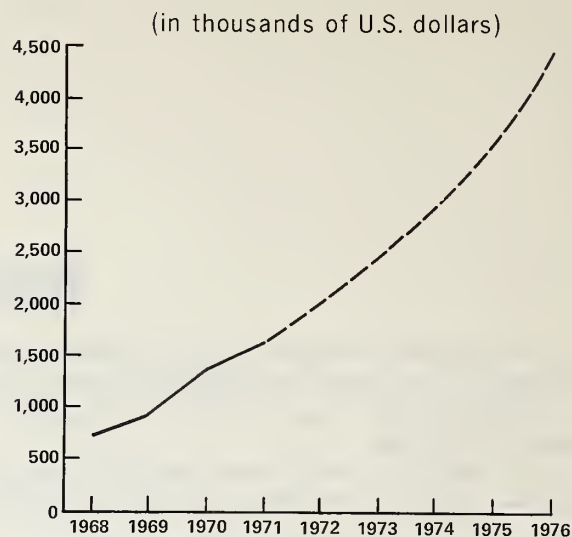
Microfilm cameras.—Cameras lead the Australian micrographics market in total sales; this trend is expected to continue as camera sales are projected to reach \$860,000 by 1976, a more than twofold increase over the 1971 level, as shown below, in thousands of U.S. dollars. The values are based on Australian trade estimates.

	1971	1976
Micrographic equipment		
Automatic retrieval devices	—	250
Cameras	375	860
Computer output micro-		
film (COM) recorders	86	50
Duplicators	46	90
Processors	33	70
Readers	182	470
Reader/printers	270	720
Automatic retrieval devices	—	250
Miscellaneous equipment	46	90
Total	1,038	2,600
Micrographic supplies	428	368
Grand total	1,466	2,968

In 1971, U.S. firms sold Australia 209 microfilm cameras, or slightly more than half the total number of cameras imported during that year.

Readers and reader/printers.—Australian demand for readers and reader/printers is expected to more than double between 1971 and 1976, rising from \$452,000 to about \$1.2 million. Reader/printers are second only to cameras in total sales volume, with total purchases projected to climb from the 1971 level of \$270,000 to over \$700,000 by 1976. Readers are the third largest segment of the micrographics equipment market, with 1971 sales totaling \$182,000. This figure should ap-

Figure 1. - Size of Australian market for micrographics equipment and supplies, 1968-71, & projected 1976



Source: U. S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Australian trade estimates.

proach \$500,000 by 1976. Demand will be strongest for microfiche readers and reader/printers.

Of the 850 readers and reader/printers imported by Australia in 1971, the United States supplied 626, or over 70% of the total.

Automatic retrieval devices.—The Australian market for automatic retrieval devices is just now developing. Sales of these devices are expected to experience rapid growth as large organizations become familiar with a systems application of micrographics. Local trade sources say the automatic retrieval device market should reach a projected level of about \$250,000 by 1976.

Services.—The Australian market for micrographic services has undergone a dramatic growth period, increasing more than two fold in 1971 to \$1.2 million from the 1968 level of \$480,000. An even more rapid expansion is expected during the next 5 years. Forecasts indicate an increase in the services market to about \$2.9 million, representing an average annual growth rate of over 19%.

Microfilm Age Opens

Australia's underdeveloped micrographics market is entering a transitional period. The next few years will see rapid growth in the number of micrographics equipment users and more intensive use of such equipment by present customers. The government and commercial sectors are the largest of Australia's eight leading purchasers of the product category. Together, they account for nearly half the country's total annual consumption. The other six most lucrative sales prospects are private industry, service centers, medical facilities, libraries, educational institutions, and public utilities.

Commercial.—The commercial sector traditionally has been one of the largest users of micrographics products in Australia, with about 21% of the total market. This sector purchased \$340,000 worth of micrographics equipment and supplies in 1971. The figure is expected to reach the \$900,000 mark in 1967 (see table 3).

Economic indicators show the commercial sector sustaining its high growth rate. Gross fixed capital expenditure is expected to maintain its present annual growth rate of about 8%. Contribution to net national product by this sector has been increasing at an even faster rate of growth—from \$5.7 billion total value at factor cost in 1968 to \$11.1 billion projected for 1976.

Within the commercial sector, banks and finance houses hold the best prospects for increased micrographics equipment usage. While this sector's traditional uses of such equipment have been archival, study groups have been looking into new applications for banks.

A prime micrographics equipment user in this segment of the market is the Bank of New South Wales in Sydney. Its system allows daily microfilming of checks and updating of customer share portfolio accounts. The system consists of four Kodak Recordak Reliant HRW1 microfilmers, four 3M 400 C reader/printers, five 3M readers, three 3M Alos LCM viewers, and two Kodak 310 A readers.

In addition, each of the bank's branch offices in Melbourne, Brisbane, Adelaide, and Perth has one Kodak Reliant 400 microfilmer. At present, the bank also uses the services of a COM service bureau. However, it plans to install its own COM system once uniform legislation is passed by the Commonwealth Government making microfilm admissible in federal courts as legal evidence. This bank is representative of the trend surfacing in the Australian banking industry toward a more intensive and sophisticated application of micrographics.

The Rural Bank, another potentially large user of the product category, now owns one reader and several cameras, all older types, used primarily for microfilming checks. Future plans of this bank, which recently installed a computer, include installation of a COM system.

Another potentially large buyer of micrographics equipment is the Australian and New Zealand Bank, Ltd., in Melbourne. This bank is considering the purchase of a camera, three readers, and a reader/printer for each of its Melbourne and Sydney offices. Its plans also include installation of a COM system.

Insurance companies also offer good sales opportunities for micrographics systems and equipment, with many companies giving serious consideration to COM units. A potentially large user of micrographic prod-

ucts is the Mutual Life and Citizens Assurance Co., Ltd. (MLC), of Sydney. This insurance company owns 12 3M 400 M reader/printers and two DatagraphiX 1400 viewers. In addition, MLC is now using a COM service bureau in Melbourne.

Among the leading financial establishments with micrographics operations is the stock brokerage firm of Rudd, Bain, MacDonald & Co., in Sydney. The firm's Kodak microfilm system comprises one Recordak Reliant microfilmer, one Recordak Starmatic reader PVM, one Recordak Magnaprint reader PE-1A, and one Recordak Prostar processor. The system is utilized to microfilm all documentation (delivery slip, broker transfer, and share certificate) which relates to each individual stock transaction.

Another financial house that is considered a prime prospect for setting up a microfilm department is the L. J. Hooker Investment Corp., Sydney. The firm expects soon to apply micrographics technology to improve its information handling operations. Expectations are that it will install its own COM system in the near future.

The Sydney-headquartered David Jones, Ltd., chain of department stores is already a relatively large user of micrographics equipment. The basic components of its present system are two Kodak Reliant 600 microfilmers and four Kodak Recordak Starmatic readers. The system is used in the handling of all accounting records, statement charges, and account dockets.

Government.—The government is the largest single market for micrographics equipment in Australia. Five-year projections show the government increasing its gross fixed capital expenditure substantially, from the 1968 level of over \$2 billion to over \$4.6 billion by 1976. Other economic indicators show the size of the government increasing, particularly as it plays an ever-expanding role in regulating a developing industrialized economy. Best estimates show the government's share of net national product at almost \$2 billion by 1976, not including publicly owned utilities.

The government spent an estimated \$389,000 for micrographics equipment and supplies in 1971, or about 24% of the total Australian market. Two factors which inhibit sales of micrographics equipment in the government sector are, legal restrictions on the admissibility in evidence of microfilm records, and budgetary constraints. Notwithstanding these inhibiting factors, demand by this sector is expected to continue its strong rise during the years ahead. Current projections are that government purchases will account for 28% of the market, or \$1.2 million, by 1976.

The Commonwealth Department of Printing, Canberra, has set up a micrographics installation to meet

Table 1.—Australia: Size of market for micrographics equipment and supplies, 1968-71, and projected 1976 (in thousands of U.S. dollars)

	1968	1969	1970	1971	1976
Production	—	—	50	155	1,470
Imports	701	917	1,328	1,466	2,968
Exports	—	—	—	—	—
Size of market	701	917	1,378	1,621	4,438

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Australian trade estimates.

Table 2.—Australia: Value and market share of imports of micrographics equipment and supplies by country of origin, 1968-71¹

(value in thousands of U.S. dollars)

	1968		1969		1970		1971	
	Value	Market share percent	Value	Market share percent	Value	Market share percent	Value	Market share percent
United States	452	64	643	70	997	75	910	62
United Kingdom	176	25	175	19	186	14	307	21
Japan	41	6	73	8	106	8	73	5
Germany	27	4	9	1	13	1	103	7
Other	5	1	17	2	26	2	73	5
Total	701	100	917	100	1,328	100	1,466	100

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Australian official statistics and trade estimates.

¹ Years ending June 30.

its in-house needs for information handling and record management. It also provides micrographics services to other Commonwealth Departments in the Federal Capital. The equipment belonging to this Department consists of one Kodak planetary camera, one 3M camera/processor, one OMAC processor, one Xerox Copyflo printer, and one 3M 400 C reader/printer.

The Aviation Medicine Branch of the Commonwealth Department of Civil Aviation maintains its own film jacket microfilming system in Canberra. Its equipment includes a Kodak Recordak RP-1E portable microfilmer, a Bell and Howell reader/filler, and six Kodak Recordak reader/printers.

The Commonwealth Department of Customs and Excise has been quick to adopt the use of micrographics equipment. Its present installation consists of 10 Kodak Recordak portable readers and 14 3M 400 C reader/printers.

Another Commonwealth Department that has moved into the micrographics field is the Office of Patent, Trade Marks and Designs, which microfilms patents for distribution to branch offices. Micrographics equipment in this office consists of one Kodak Recordak Reliant 600 microfilmer, one Kodak reader/printer, one 3M reader/printer, one reader/filler, and six reader/printers of other makes.

The Commonwealth Department of Trade and Industry also has ventured into the micrographics field. It now utilizes one Kodak Recordak portable microfilmer and 60 Kodak Recordak P 20 portable readers.

Despite its present meager machine resources, the Department of Defense represents the largest potential user of micrographics systems and equipment in the government sector. A Defense Group Committee, now examining the Department's data handling operations, is expected to encourage the Departments of the Army, Navy, and Air Force to establish sophisticated microfilming systems in the interest of efficiency in handling day-to-day information.

A market for immediate application of micrographics equipment is the Department of the Navy, which is introducing a microfiche system. Planned expenditures for such a system include the purchase of 200 to 300 microfiche readers. The Departments of the Army and Air Force are expected to follow the Department of the Navy in establishing similar microfiche systems within

the next 2 years.

At the state government level, the State of New South Wales (NSW) leads all other states in micrographics equipment usage. The NSW Department of Public Works has one Kodak planetary camera, two Kodak 600 cameras, one Kodak Recordak Prostar processor, one 3M reader/printer, one 3M card-to-card copier, and a number of readers acquired from various suppliers. The Department also acts as a service bureau for other NSW state agencies. A more limited user of micrographics products is the Department of Public Works in Victoria. Its equipment comprises one 3M camera/processor and a variety of readers and reader/printers.

The Stamp Duties Offices of each state are among the prospects whose micrographics equipment uses still are in an early stage. However, determined efforts by these offices to ensure more efficient paperwork handling should spur demand for micrographics equipment in the years ahead. The New South Wales Office is the largest user of the product category, employing one Kodak Recordak Reliant 600 microfilmer and one 3M 400 C reader/printer.

The Queensland State Department of Main Roads utilizes two Itek microfilers, one Itek processor, and two Itek reader/printers for its 35mm. micrographics applications. This Department, as well as the Victorian Department of Main Roads, is expected to expand its micrographics facilities in the near future. The equivalent department in New South Wales also is in the process of expanding its existing in-house installation.

The micrographics facilities of the New South Wales Department of Motor Transport consist of one 3M 500 cartridge reader/printer, two Kodak cameras, and two other cartridge reader/printers. Equipment used by the Victorian Motor Transport Department consists of two Bell and Howell Director recorders and two 3M 400 C reader/printers. Micrographics outlays by these two Departments should rise as increasing reliance is placed on microfilm techniques to handle and control their growing volume of records.

The Registrar General's Departments of each state are prime customers for imported micrographics equipment. In New South Wales, the Registrar General's Department is one of the largest government users of such equipment, using aperture cards extensively. This

Department operates two 3M camera/processors, two 3M reader/printers, one Fuji reader/printer, one 263 Xerox production printer, 10 Kodak Recordak RP-1E portable microfilmers, and two Kodak Recordak Motor-matic readers.

Another significant user within the Government of New South Wales is the Corporate Affairs Commission, whose installation comprises 12 Kodak Micro-Filc cameras, 20 Kodak Recordak Easamatic readers, five Bell and Howell reader/fillers, eight Bell and Howell Reporter reader/printers, two Bell and Howell Diazo printer/processors, and four Bell and Howell Autoload 2 readers.

Also, the State police departments are expected to invest in micrographics equipment in the near future. The New South Wales Police Department has already begun this process with small installations in its Accidents Reports Division and its Criminal Investigation Branch. The equipment belonging to this Department consists of two Kodak 600 cameras and three 3M cartridge reader/printers.

All Commonwealth Government contracts are arranged through the Department of Supply. While preferring to buy "Australian," the government's current policy is still "value for money." In the micrographics field, where there is no local production of equipment, this policy particularly applies.

Libraries.—Forecasts predict a threefold increase in sales of micrographics products to libraries in Australia between 1971 and 1976, going from \$114,000 to \$355,000.

Australia has eight major State and national libraries, over 700 special and university libraries, and about 650 local general libraries. Most major libraries have adopted micrographics technology for microfilming of journals and newspapers. In addition, a large number of local general libraries use micrographics equipment strictly for photobook charging. Products with highest sales potential in the library market are portable cameras, roll film readers, and roll film reader/printers.

In addition to university and public libraries, there are many industrial concerns that use micrographics equipment in their libraries. One such firm, the Australian Consolidated Industries, Ltd., Melbourne, uses a microfiche jacket system in its library for the distribution of technical information. The system consists of one Kodak Recordak Starfile microfilmer, one Bell and Howell reader/filler, and two Bell and Howell Reporter microfiche reader/printers.

The micrographics-using library of Australian Coal Industry Research Laboratories, Ltd., employs a Kodak Recordak Image Control System to record and retrieve technical articles. The Research Laboratory Library of the Colonial Sugar Refining Co., Ltd., of Sydney uses a similar system for the retrieval of information from the chemical abstracts file.

Large university libraries also are good potential customers for micrographics equipment. For example, the library of the University of New South Wales in Kensington has three full-time employees operating its micrographics installation and uses a service center extensively for overload microfilming requirements. The

library's present installation includes one microfiche reader, two 3M microfiche reader/printers, one 3M cassette reader/printer, and one Kodak card duplicator. The library plans to expand its micrographics installation substantially in the near future.

Public utilities and transportation.—The Australian public utilities sector, reflecting the general economy, has experienced an extremely high rate of capital formation. Government investment in gross fixed capital for utilities, transportation, and communications climbed from a 1968 level of \$1.6 billion to over \$2.2 billion in 1971. Demand for micrographics products by public utilities is expected to increase appreciably over the next few years. Annual purchases of \$113,000 in 1971 are expected to more than double to over \$220,000 in 1976.

All the State Electricity Commissions (SEC) are prime potential customers for micrographics equipment. The bulk of their work is in microfilming engineering drawings. The New South Wales SEC is a leading user of micrographics equipment in this sector. It utilizes one 3M camera/processor, one 3M reader/printer, one Ozalid high-speed production printer, and several aperture card readers. It also uses service centers to meet its peak microfilming needs. The Victorian SEC is equipped with one Kodak camera/processor and a variety of readers and reader/printers. It also uses service centers extensively. The Queensland SEC is in the process of establishing its own in-house installation and has a tender out for 15 readers.

State gas utilities represent a virtually untapped market for micrographics products. The Australian Gas Light Co. (AGL), a newcomer to the market, has two 3M cartridge reader/printers and three 3M readers. This company is taking its peak load processing business to a COM service bureau. Significant growth in the volume of AGL's business in the years ahead is predicated on the imminent conversion to natural gas in Australia. This implies a notable increase in AGL's capital investment in information handling equipment. The Melbourne Gas and Fuel Corp., which has yet to venture into the micrographics field, represents another large potential customer for the product category.

One of the largest users of micrographics equipment in Australia is Qantas Airways, Ltd. All its equipment is leased. The decision on whether to continue leasing or to establish its own installation will be made by May 1973, when present leasing agreements expire.

Qantas now leases 46 3M 400 C reader/printers and 46 Kodak Startech Models SP3.2 readers. This equipment is used primarily for microfilming manuals relating to manufacture, maintenance, structure, and illustrative parts. The use of micrographics techniques is being reviewed by Qantas; all indications are that the company will greatly expand its present system.

Trans-Australian Airlines (TAA) and Ansett Airlines of Australia have the potential for establishing in-house micrographics installations on a scale comparable with that of Qantas. Microfiche systems for cataloging and maintenance manuals are being evaluated by both TAA and Ansett.

National Roads and Motorists Association operates one Kodak Recordak Micro-File camera and a 3M

Table 3.—Australia: Expenditures for micrographics equipment and supplies by principal user sectors, 1971, and projected 1976
(in thousands of U.S. dollars)

Sector	Value	1971	1976	Market share percent
		Market share percent	Value	
Government	389	24	1,242	28
Commercial	340	21	843	19
Industrial	310	19	666	15
Service centers	194	12	444	10
Medical	81	5	355	8
Libraries	113	7	355	8
Education	81	5	311	7
Public utilities	113	7	222	5
Total	1,621	100	4,438	100

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Australian trade estimates.

Page Search reader/printer. The Royal Automobile Club of Victoria (RACV) has a Kodak Recordak Image Control Retrieval System and is using the services of a local COM service center. RACV is investigating possible expansion of its present facilities.

Education.—Education is a steadily growing segment of the Australian economy in terms of such important economic indicators as capital expenditure and contribution to the national product. Gross fixed capital expenditure in this sector, estimated at \$277 million in 1971, is expected to reach \$400 million by 1976. Education in Australia, for the most part under government control, is expected to increase its contribution to net national product at about the same rate as the government in general; by 1976, education's part of the net national product probably will reach \$196 million, representing a twofold increase over 1968 levels. Given Australia's very high level of per capita income and the population concentrations around school age, the educational sector will continue to grow in size and sophistication.

Australian educational institutions have made little progress in introducing microfilm technology. Purchases of micrographics equipment by this segment of the market amounted to \$81,000 in 1971, or about 5% of the total. By 1976, it is estimated that education will account for 7% of the market, or \$311,000. Strong demand for cameras, readers, reader/printers, and services will account for the greatest part of this anticipated increase.

Among the more promising prospects for micrographics equipment in this segment of the market are the Commonwealth Department of Education and Science (CDES) and the various state departments of education. CDES is seriously considering using micrographics equipment for file recording and information storage. Although present usage of micrographics products by the state departments of education is limited to reader/printers, their urgent need to solve mounting paperwork problems through increased information processing power is expected to stimulate demand for additional equipment.

Medical.—Within the general economy, the medical sector continues to grow, as one would expect in a

highly developed nation. This sector is expected to double its segment of net national product in the period 1968-76. Gross fixed capital expenditure is expected to increase at a similar rate, from \$73 million in 1968 to a projected \$138 million by 1976.

Demand for micrographics products by the medical sector is expected to reach \$355,000 in 1976, up from \$81,000 in 1971. As more and more hospitals turn to micrographics equipment to cure their mounting paperwork ills, the demand for cameras and duplicators is expected to triple. A fourfold increase in purchases is anticipated for such items as processors, readers, and reader/printers.

The medical profession in Australia is well informed about micrographics technology and has shown strong interest in replacing active paper files with active microfilm files. Budgetary constraints are the main factor inhibiting the development of this market sector. More flexible financing would facilitate penetration of the medical sector.

The biggest user of micrographics equipment among hospitals is the Royal Children's Hospital in Melbourne. This hospital has a large microfiche jacket system used primarily for microfilming patient medical records. The Royal Hospital for Women in Sydney employs, for the same application, a similar microfiche system. The system includes one Kodak Recordak RP-1E portable microfilmer, one PFC-1A microfiche reader/printer, one FRF 1200 jacketing machine, eight Kodak Easomatic readers, and one Bell and Howell portable reader. Future expansion plans include the installation of a COM unit.

The following hospitals can be expected to use micrographics equipment extensively in the near future: King Edward Memorial Hospital, Perth; Royal Alexandra Hospital for Children, Sydney; Women's Hospital, Sydney; and the Royal Women's Hospital, Melbourne.

Some other Australian hospitals offering attractive opportunities to U.S. suppliers of micrographics products are the Canberra Community Hospital, Acton; Alfred Hospital, Melbourne; Royal Children's Hospital, Brisbane; Queen Elizabeth Hospital, Adelaide; and Sunset Hospital, Perth.

Industrial.—Australia's rapidly developing industrial

complex, as evidenced by an extremely high rate of capital formation, makes this sector a prime market for advanced U.S. equipment and technology. Gross fixed capital expenditure in the industrial sector is expected to nearly double in the period 1968-76—from slightly more than \$1 billion to over \$2 billion. The significance of this sector is also measured by its contribution to the general economy. This amounted to one-third of the total net national product in 1971.

As the industrial sector grows in size and complexity, its need for micrographics equipment also is increasing. In 1971, this sector accounted for about 19%, or \$310,000, of the total Australian market for micrographics equipment and supplies. Trade sources predict this figure will approach \$700,000 by 1976. Present usage is primarily for microfilming historical records, budgets, expense reports, and ledger cards. Major demand by industrial establishments will be for cameras, readers, and reader/printers. Sophisticated centralized systems are just beginning to penetrate this market sector and show good growth potential for the future. Service centers are extensively used by industry and this trend is expected to continue for the next few years.

Both General Motors Holden's Pty., Ltd., Melbourne, and the British Leyland Motor Corp. of Australia, Ltd., have large 35mm. systems embracing Kodak and 3M equipment. These companies keep their micrographics departments under constant review and are prime potential customers for additional equipment.

Some other micrographics equipment-using industrial enterprises that should be mentioned are the Ford Motor Co. of Australia, Ltd., Melbourne, with 70 DatagraphX microfiche readers; Caterpillar of Australia, Ltd., Melbourne, with a number of 3M and NCR readers and reader/printers; and Clark Equipment Australia Pty., Ltd., with 10 Bell and Howell Duo microfiche readers.

Service Centers.—Purchases of micrographics equipment and supplies by service centers, valued at \$200,000 in 1971, are expected to increase 18% annually to almost \$500,000 in 1975.

Four commercial COM service centers are in operation in Australia. These centers, with the type of equipment employed shown in parentheses, are: IDAPS Computer Services, Ltd., Sydney (3M-EBR); D.C. DatagraphX, Melbourne (SD-4460); Consul Print, Melbourne (KOM-90); and Standard Telephone and Cables Pty., Ltd., Sydney (Pertec 3700).

All four COM installations operate off-line and use 16mm. film. Services include data capture, production, processing and duplication of roll film and microfiche, and production of hard copy.

In addition, there are 27 conventional microfilm service centers operating at present in Australia. Nine of these centers are located in Sydney, seven in Melbourne, five in Brisbane, four in Adelaide, and two in Perth. Many companies in Australia use these independent service bureaus on an experimental basis until an in-house operation can be justified.

Service centers will play an increasingly important role as information specialists in the micrographics field. With the exception of film, which will substan-

tially be supplied by local producers in the future, service centers will import all of their micrographics products, mainly from the United States.

Legal Aspects

Most Australian states recently have enacted legislation removing the major legal restrictions on the use of microfilm.

All states except South Australia and Tasmania have passed an Evidence Act Amended (1970) related to microfilm. The act does not as yet have an equivalent at the Commonwealth level. At present, a statutory declaration is required for microfilm to be admissible in law courts or to be part of a legal contract. It is expected, however, that the Commonwealth will pass liberalized legislation in the near future to remove this major handicap to the use of micrographics equipment in Australia.

Competitive Environment

The United States is Australia's leading supplier of micrographics products, accounting for over 60% of the market by value and 90% in many product subcategories. While stronger competition is expected from Japan, Germany, and the United Kingdom in the future, the United States should retain and consolidate its well-established lead in the Australian micrographics equipment market.

The imposition of a dumping duty against imported film in March 1970 was designed to encourage local production of micrographics supplies. Kodak (Australia) Pty., Ltd., a wholly owned subsidiary of the U.S. parent company, now supplying about 20% of the Australian film market, is expected to increase local production substantially during the next few years.

With the exception of the United Kingdom, which enjoys a special trade relationship with Australia, importers are charged a 17½% duty rate on microfilm readers, reader/printers, jacketing systems, and perforated film not greater than 16mm. Microfilm cameras are admitted duty-free, but a 7½% duty is levied on perforated roll film in bulk and sensitized roll paper in bulk. Information on specific duty rates may be obtained from the Office of International Marketing, Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

In addition to the import duty, Australia levies a general sales tax of 15% (and, in some cases, up to 30%) computed on the figure arrived at by adding the product's dutiable value, the duty itself, plus 20% of the resulting sum. The sales tax is levied universally on all sales in Australia irrespective of the origin of the item sold. The import duty and the sales tax are the only charges officially levied on manufactured items imported into Australia.

Technical Standards

Electrical standards are 240 volt, 50 cycle or 3-phase, 415 volt, 50 cycle for heavy power usage, 3-pin (active, neutral, and earth) plug. While no formal procedure is required to obtain approval of imported equipment

to meet Australia's standards, it is wise to consult with the Standards Association of Australia, 80 Arthur St., 2060 A.C.T., North Sydney, and the Department of Customs and Excise, Canberra, 2600 A.C.T.

Australia is now in the process of changing over to the metric system.

Most microfilm used is 16mm.; 35mm. is used mainly for engineering drawings, and demand for 70mm. is limited. Purchases of diazo and vesicular film are rapidly gaining popularity.

Microfiche standard format is 105 x 148mm. with 60 frames per microfiche. The most common reduction

ratios are 20:1 and 24:1 (ranging up to 40:1) for letter and legal-size documents, and 6:1 and 10:1 (ranging up to 30:1) for engineering drawings.

A loan copy of basic research report "Micrographics—Australia," DIB 72-09-507, October 1971, upon which this Export Market Digest is based, may be obtained from the Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

Belgium

Micrographics equipment usage is on the upswing in Belgium as more and more Belgian companies seek to make their data-handling operations more efficient. The market for the product category developed dramatically in the late 1960's and holds promise of continued rapid growth in the 1970's.

American exporters are in an excellent position to capitalize on Belgium's needs to modernize its information processing, storage, and retrieval operations through the widespread adoption of advanced micrographics technology. U.S. exporters, whose share of the Belgian market is on the increase, stand to reap the benefits of their competitive edge in this growth market.

Highlights

► Belgian purchases of micrographics equipment and supplies are expected to top \$6 million in 1976, an increase of 78% over 1972.

► Imports supply over 90% of the total Belgian micrographics market.

► U.S. suppliers captured a 55% share of total imports in 1971 with sales of \$1.5 million.

► Based on their present share of the Belgian import market, U.S. exporters can look forward to about \$3 million in sales to this market by 1976.

► Demand over the next few years should be particularly strong in the commercial, government, and industrial sectors.

► Sales of readers are expected to increase at a rate of 14% yearly, boosting 1972 sales of \$600,000 to over the \$1 million mark by 1976.

Healthy Growth Forecast

The total market for micrographics equipment and supplies in Belgium nearly tripled during the 1968-72 period, rising from \$1.2 million to \$3.5 million (see table 1). In 1972, equipment accounted for \$2.1 million, or 60% of the total market; and supplies comprised \$1.4 million, or 40%.

The market is expected to continue its strong rise at a healthy annual rate of 15% and reach a projected level of about \$6 million in 1976 (see figure 1). Equipment purchases in 1976 are projected to account for \$3.3 million, or 55% of the total; and supplies \$2.7 million, or 45% (see table 2).

Local production is limited to micrographics supplies, and Belgium's requirements for hardware are supplied entirely by imports. In 1972, imports accounted for nearly 95% or \$3.3 million of the total market, a three-fold increase over the 1968 figure. Spurred by the rapid expansion in the use of advanced micrographics systems and equipment, imports are expected to increase at an average annual rate of 15% and reach \$5.6 million in 1976.

The United States now is—and is expected to remain—Belgium's principal micrographics equipment supplier by a wide margin. The annual U.S. share of the Belgian import market for such equipment averaged 54% during the 1968-71 period. In 1971, the United States provided about \$1.5 million, or 55%, of the total micrographics import market (see table 3). Other major suppliers in 1971 were Germany and France. Germany supplied \$620,000, a 23% share of imports, and France \$340,000, a 13% share.

Specific Sales Opportunities

Belgium is expected to purchase about \$25 million worth of micrographics equipment and supplies during

the period 1972-76. Imports from the United States should account for more than half of this consumption. A recent market survey conducted in Belgium for the U.S. Department of Commerce has identified the following micrographics products as offering best sales prospects for U.S. manufacturers:

- Rotary cameras
- Readers
- Reader/printers
- Computer-output-microfilm (COM) recorders

The survey emphasized that U.S. sales opportunities are by no means limited to the above products. Practically all U.S. micrographics equipment should find a ready market in Belgium.

Cameras.—Cameras represent the third largest segment of the product category, in value terms, after readers and COM devices. Purchases of cameras increased twofold to \$200,000 between 1968 and 1971. Camera sales are predicted to grow at an average annual rate of 28% during the period 1972-76, rising from \$300,000 to \$800,000. Rotary cameras should continue to account for 90% of total camera sales until the library market for planetary cameras begins to climb. Demand for cameras will be strong as the use of low-priced, easy-to-operate film processors expands. Particular interest is expected to be shown in 16mm. cameras.

Readers and reader/printers.—Readers and reader/printers, now accounting for 38% of the hardware market, will find a rising market as a result of acceleration of new micrographics installations and upgrading of existing systems. Demand for readers is expected to increase at a rate of 14% annually, boosting 1972 sales of \$600,000 to over the \$1 million mark by 1976. Sales of reader/printers have doubled since 1968, reaching \$200,000 in 1972. This figure should rise to \$300,000 in 1976.

Computer-output microfilm (COM) devices.—Belgium was an early user of COM devices. Local trade sources estimate that about 10 to 13 COM units are installed in the country today. Belgium's demand for COM units is expected to increase markedly, with 25 to 30 to be in operation by 1976. Forecasts indicate that sales of COM systems will total \$3.2 million during the period 1972-76. The United States, the world leader in the COM field, should continue to dominate the Belgian market for COM devices through at least 1976.

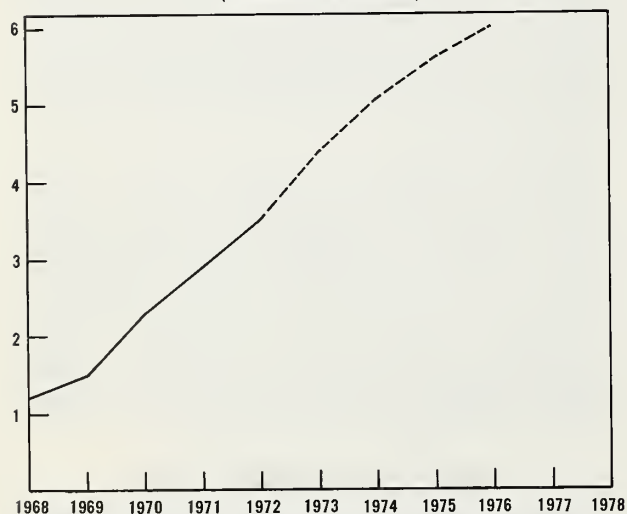
Micrographics supplies.—Sales of micrographics supplies amounted to \$1.4 million in 1972, a 40% share of the total Belgian market for the product category. Demand for supplies is expected to nearly double by 1976 to \$2.7 million. Exceptional growth is forecast for diazo film in conjunction with expanded COM usage. The bulk of the demand for supplies is being met by U.S. manufacturing subsidiaries in Western Europe. However, direct imports from the United States will continue to fill Belgian demand for the higher grade supplies.

Duplicators.—Duplicator sales are expected to remain relatively stable—at \$200,000 annually—from 1972 through 1976, representing a twofold increase over the 1971 level. The \$200,000 annual sales level is a modest estimate, and the marked acceleration in the general application of micrographics technology could well push sales of duplicators over the forecasted amount.

Micrographics services.—The annual market for micrographics services in Belgium is expected to reach \$500,000 by 1976, up \$200,000 from its 1972 level. While micropublishing activity in Belgium is currently insignificant, micropublishing services hold promise for expanding sales as they gain in popularity. Sales of micropublishing services are projected to reach \$400,000 by 1976.

1. — Belgium: Size of market for micrographics equipment and supplies, 1968-72, and projected 1976

(in millions of U.S. dollars)



Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Belgian trade estimates.

Information Processing Demand Rises

The banking industry has set the trend now surfacing in the Belgian economy toward modernization of information processing systems. Beseated by mounting paperwork problems and burdensome storage costs, Belgian banks have turned to microfilm techniques to improve their data-processing operation at reduced cost. Successful utilization of micrographics equipment and systems by Belgian banks has led the way for widespread adoption of micrographics techniques by other important sectors of the economy.

The commercial sector is the leading user of micrographics products, accounting for about 55% of the total market, followed by government and industry, each with 20%. In addition to these market sectors, there is virtually an untapped reservoir of demand for microfilm products in hospitals, libraries, universities, and service centers (see table 4). International organizations that are headquartered in Belgium, such as NATO and the European Economic Community (EEC), represent another source of expanding demand in the Belgian micrographics market. As these and other potential markets are developed through intensified sales efforts, the high growth rate of the Belgian

Table 1.—Belgium: Size of market for micrographics equipment and supplies, 1968-72, and projected 1976¹
(in millions of U.S. dollars)

	1968	1969	1970	1971	1972	1976
Production	2.0	2.6	3.0	3.4	4.0	7.0
Imports	1.1	1.4	2.1	2.7	3.3	5.6
Exports	1.9	2.5	2.8	3.2	3.8	6.6
Size of market	1.2	1.5	2.3	2.9	3.5	6.0

¹ Size of market equals production plus imports minus exports.

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on Belgian trade estimates and BIC analyses.

micrographics market should be sustained through at least the next 5 years.

Commercial.—Banks are by far the most significant micrographics equipment-using group in the Belgian commercial sector. They now account for about 55% of the country's total micrographics market. Many banks are actively engaged in programs to upgrade operations to handle their rising tide of paperwork. In recent years, their expenditures for micrographics equipment have been increasing 25% annually.

One Belgian bank, Societe Generale de Banque, headquartered in Brussels, has led the way in applying micrographics techniques to banking procedures. With \$1.8 billion in deposits and over \$2.3 billion in assets, Societe Generale is Belgium's largest bank. It has some 800 branches and holds more than 40% of the country's total deposits.

This bank has introduced a sophisticated microfilming system to reduce its staggering paperwork load. Societe Generale is probably one of the largest users of the product category in Europe. It has six regional computing centers which are fully equipped for automatic data processing. In addition to an IBM 360/45 computer and optical readers, each center has one COM recorder, one processor, one duplicator, and one reader. Furthermore, some 40 readers are used in the bank's Brussels headquarters.

Equipment operated by this bank also includes 2,400 SEACO readers, three in each of its 800 branches. These facilities have enabled the bank to speed regional data center-to-branch communications. All transactions are processed overnight and printed on microfiche for distribution to all branch offices. Three of the bank's COM systems were purchased from DatagraphiX and the rest from SEACO.

Now under consideration by the bank is the acquisition of an automatic retrieval system. The bank purchases about \$200,000 worth of micrographics supplies annually and estimates its supply purchases will reach \$500,000 annually in a few years.

Cost savings and improvements in customer service attributed to Societe Generale's adoption of microfilm technology have made a significant impact on micrographics equipment sales to financial institutions, and accelerated acceptance and use of microfilm techniques by financial organizations.

Banque de Bruxelles (Bank of Brussels) has installed a micrographics system based on a Kodak KOM 90 microfilmer. Belgium's two other major banks,

Krediet Bank N.V. and Banque Lambert, both headquartered in Brussels, are seriously considering the purchase of COM systems. The Krediet Bank also is reported to be interested in acquiring cameras and other micrographics equipment for each of its 250 branch offices.

Government.—The Belgian Government's total capital expenditures were estimated at \$1.9 billion in 1972. According to knowledgeable Belgian trade sources, the government sector in 1972 accounted for an estimated 20%, or \$700,000, of the country's total micrographics market.

Government-controlled financial institutions tend to follow the strong lead set by the banking industry in micrographics equipment usage. Comptes Cheques Postaux, a checking account system operated by the Post Office, has centralized all accounting operations at its Brussels headquarters, using a Kodak KOM 90 microfilmer. They do all their data processing at night in order to have an updated balance for each customer account by morning.

Comptes Cheques Postaux also uses a Kodak Reliant 600 microfilmer to record all incoming documents, including credit slips, payment orders, and checks. This institution expects to expand its micrographics facilities over the next few years. It has an immediate need for additional readers and is seriously considering the acquisition of an automatic retrieval system.

Credit Communal, a Brussels-headquartered financial institution with branches throughout the country, provides financial services to municipalities, as well as banking services to individuals. It has developed an automated coupon bonds and securities registration system by combining optical character recognition and COM technologies.

Credit Communal microfilms all incoming documents, using a Kodak Reliant 600 microfilmer. A Kodak KOM 90 system installed at its central computer center in Brussels allows daily updating of its 500,000 customer accounts. Credit Communal sends to all its branches and agents daily information, including microfilmed records, for each of their customer accounts. It now plans to change its film format from roll film to microfiche. Implementation of this plan will involve the addition of 28 microfiche readers.

Credit Communal is the largest issuer of bonds in Belgium. It handles a very large volume of securities and bond coupons. All securities and coupons are microfilmed for archival purposes and for checking

Table 2.—Belgium: Sales of product category by principal subcategories, 1972, and projected 1976
(in millions of U.S. dollars)

	1972	1976
<i>Micrographics equipment</i>		
Readers .....	.6	1.0
Computer-output-microfilm (COM) devices .....	.6	.6
Cameras .....	.3	.8
Reader/printers .....	.2	.3
Duplicators .....	.2	.2
Processors .....	.1	.2
Other equipment .....	.1	.2
Total	2.1	3.3
<i>Micrographics supplies</i>	1.4	2.7
Grand Total	3.5	6.0

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on Belgian trade estimates and BIC analyses.

possible errors in the optical scanning process. Micrographics equipment being utilized by this publicly owned bank comprises 28 readers, one processor, and one duplicator. Future plans include acquisition of an automatic retrieval system.

Caisse D'Epargne, Brussels, is another government-controlled savings institution that has introduced micrographics operations. It recently installed a Memorex COM system to meet its growing information and records handling needs.

The use of microfilm has had less significant penetration in nonfinancial government agencies. Knowledgeable trade sources consider this potential market virtually untapped, as there are several large Belgian government agencies that would greatly benefit from labor- and time-saving micrographics technology.

The Ministere de l'Education National (Ministry of Education), one of the country's largest employers, is a prime potential customer for microfilm equipment, particularly for personnel management applications based on COM technology. Another potentially significant user is Fichier National, which maintains a general comprehensive record of personal data concerning all Belgian citizens.

Another government entity showing excellent sales potential for the product category is the Institut National de Statistique (National Institute of Statistics—INS), an agency of the Ministry of Economic Affairs, which now operates the second largest and most advanced data-processing center within the Belgian Government. As a high-volume processor of government statistics, INS is a prime prospect for advanced micrographics equipment. The Belgian Social Security Administration (Securite Sociale) is yet another government agency considered a good prospect for adoption of microfilm technology.

Industry.—Sales of micrographics equipment and supplies to the industrial sector in 1972 amounted to \$700,000, or 20% of the total micrographics market. As Belgium is essentially an industrial-processing and export-oriented country, with industry contributing more than half of the gross national product, manu-

facturing concerns are under continual pressure to adopt new labor saving technologies to remain competitive in the world market. It is therefore expected that demand by this sector for micrographics equipment and systems will increase at least 8 to 10% annually.

Among the leading industrial firms with micrographics operations is Ateliers Constructions Electriques de Charleroi, Brussels. Its present system, which includes 20 16mm. rotary cameras, is extensively used to microfilm all incoming mail prior to intercompany distribution.

Solvay Cie, S.A., Brussels, is another major industrial enterprise employing micrographics equipment. This company's system includes two Memorex COM recorders. The system is used in the handling of personnel records, customer statements, and all general accounting records.

Outboard Marine, a U.S. subsidiary, is still another industrial firm that has set up a sizable microfilming department. Its facilities are based on a Memorex COM system.

Unlike those in many other countries, public utilities in Belgium are privately rather than government owned. They have the reputation of being far more receptive to accepting new technologies than their foreign counterparts. Several leading Belgian utilities are considered prime prospects for adoption of micrographics techniques in their data processing operations. Two such firms, for example, are Electrobels in Brussels and Esmalux in Auvelais. Micrographics equipment suitable for engineering drawings and business management applications are expected to show the greatest growth potential among utilities in the years immediately ahead.

Medical.—Although Belgian hospitals have been slower to adopt microfilm technology than other user groups, they are rapidly becoming micrographics-conscious, with some of the large hospitals showing very active interest. The Academic Hospital at Ghent State University, with 1,200 beds, found that the huge volumes in which patients' records were kept proved too cumbersome for use for medical purposes. To overcome the disadvantages of keeping records in their original state, this hospital installed a medical records microfilm system. The system is also used for microfilming administrative and pharmacy records, as well as library items. Components of the hospital's present microfiche jacket system include cameras (16mm. rotary type for microfilming paper documents and 35mm. planetary type for microfilming X-ray sheets); and processors, duplicators, and jacket mounters for both 16mm. and 35mm. applications. Each department of the hospital has its own readers and/or reader-printers. A Kodak Recordak Microstar IE-5 reader-printer is used by the hospital's library for retrieval of information from medical journals. It is believed that this hospital will soon install a COM system.

The Centre d'Information Medicale des Hospitaux Universitaires de Bruxelles (CIMHUB), a central information service for university hospitals, has established a micrographics system that includes three Kodak Reliant cameras, one processor, one duplicator,

Table 3.—Belgium: Value and market share of imports of micrographics equipment and supplies by country of origin, 1968-71 (in thousands of U.S. dollars)

	1968		1969		1970		1971	
	Value	Market Share Percent	Value	Market Share Percent	Value	Market Share Percent	Value	Market Share Percent
United States	550	50	750	53	1,160	55	1,500	55
Germany	290	26	340	24	460	22	620	23
France	150	14	200	14	270	13	340	13
Other	110	10	110	9	210	10	240	9
Total	1,100	100	1,400	100	2,100	100	2,700	100

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on Belgian trade estimates and BIC analyses.

three reader/printers, and approximately 50 readers. CIMHUB uses this equipment to microfilm all patient medical records and all hospital requisition slips. In addition, they use a local Kodak service bureau to microfilm all patient invoices.

Libraries.—Belgium has about 5,000 public libraries. Although micrographics technology has made little penetration in this sector, libraries comprise an additional large market potential for the product category. Substantial new sales of micrographics equipment for library use should result over the next few years. Demand is expected to be strongest for moderately priced cameras and processors.

Among the Belgian libraries that have ventured into the micrographics field are the three public libraries of Malines. Together, they have a total of 25 cameras used primarily for microfilming book-lending records. Another library application now gaining momentum is the microfilming of rare books which are not publicly circulated.

Service centers.—About 10 fulltime conventional microfilm service centers now operate in Belgium. Five of these centers are in Brussels. Kodak operates the only commercial COM service bureau in the country. In addition, several large users, such as Societe Generale de Banque, are entering the service bureau market commercially in order to sell spare time on their COM installations to outside users.

The country's largest microfilm service center is Etablissements Raoul Simon in Brussels. Other Brussels-based service centers are Micrographics; Burma Faoma; Copimatic; A. Braun Copy Service; and Microfilm Technik. These centers offer a wide range of microfilm services, but the bulk of their current work is in engineering drawing applications.

International organizations.—International organizations headquartered in Brussels represent another growing segment of the Belgian micrographics market. NATO, the EEC, and such related agencies as the European Atomic Community and the European Coal and Steel Community are moving rapidly toward in-house micrographics systems to increase information-handling efficiency, space savings, and file security. To date, only the documentation centers at EEC and NATO use micrographics equipment to any significant

degree, leaving a large potential customer group yet to be fully exploited by American producers.

Legal Aspects of Microfilm

In Belgium, the legal status of microfilm is at the discretion of the courts on a case-by-case basis. The lack of a firm position on the legal acceptability of microfilmed documents does not, however, seem to be an inhibiting factor for micrographics sales in Belgium. Some companies destroy their original documents once they are recorded on microfilm, figuring it is less expensive to lose a trial because original documents are not available than to pay for costly storage space. Court records show that no trial has been lost because microfilmed records were submitted as evidence.

Competitive Environment

The U.S. share of the Belgian import market for micrographics equipment and supplies rose from 5% (\$550,000) in 1968 to 55% (\$1.5 million) in 1971. The United States is expected to retain, and possibly increase, its import market share in the years ahead. Because of their technological superiority and economy-of-scale production, U.S. manufacturers of the product category hold a big lead over other foreign suppliers. Other major suppliers in 1971 were Germany, with a 23% share of imports, and France, with a 13% share.

Production of the product category in Belgium increased from \$2 million in 1968 to an estimated \$4 million in 1972 (see table 1). It should be noted, however, that local manufacturers concentrate on the production of micrographics supplies. There is no domestic production of micrographics equipment in Belgium, and none is foreseen for the immediate future. The Belgian micrographics industry is export-oriented, and the bulk of its output leaves the country. Exports represented an estimated 95% of total production, or \$3.8 million, in 1972.

Six subsidiaries of U.S. micrographics equipment manufacturers operating in Belgium import their micrographics equipment and part of their supplies from the United States. In the supplies area, strong competition comes principally from Belgium-based Agfa-Gevaert, the largest photo-film (microfilm) manufacturer in

Table 4.—Belgium: Value and market share of micrographics consumption by principal user sectors, 1972
(in thousands of U.S. dollars)

Sector	1972	Percent
Commercial	1,925	55
Government	700	20
Industry	700	20
Other (including hospitals, libraries, universities, service centers, and international organizations)	175	5
Total	3,500	100

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on Belgian trade estimates and BIC analyses.

Europe. Kodak N.V. in Vilvoorde virtually dominates the 16mm. equipment market in Belgium and has had some success in the COM area. 3M Belgium N.V. in Diegem is particularly strong in the 35mm. equipment line. Other U.S. companies represented in Belgium are Bell & Howell, Memorex, DatagraphiX, Remington Rand, and Rank Xerox.

Belgium is a member of the European Economic Community (EEC) and of the General Agreement on Tariffs and Trade (GATT). There are no duties on imports of industrial goods among EEC countries, and duties on imports from non-EEC countries, including the United States, are determined by the EEC's common external tariff rate. The tariffs, as they relate to micrographics products, are as follows: A 13% ad valorem rate on all micrographics equipment except readers, reader/printers, and COM recorders; a 10.5% ad valorem rate on readers and reader/printers; a 12.8% ad valorem rate on sensitized and nonperforated films in reels or strips; and a 7% rate on COM recorders. Goods imported from the United States also have to bear the value added tax on the c.i.f. price at 18% on equipment and most supplies. A 25% rate applies to film narrower than 16mm.

Sales Development

Belgian buyers seem to have the same general requirements as Americans in terms of price, warranty, maintenance, and servicing. They readily accept U.S.-made micrographics products as originally designed to suit the U.S. market. Most agents/distributors operate out of the Brussels area, accounting for 70% of the country's micrographics consumption. Almost all equip-

ment is sold with the exception of COM devices, which are generally leased.

Two trade promotion events that provide an effective means of introducing U.S. micrographics products to the Belgian market are the Salon de la Mecanographie, held every other year in Brussels, and the French SICOB (Salon de l'Information de la Communication et de l'Organization de Bureau), held annually in Paris.

Penetration of the market can be facilitated by advertising in the following trade journals: *Le Marche, Belgian Business, Bulletin de la Federation des Industries Belges, Par-De La, Paninformatic, and Bulletin de la Mecanographie Belge*. The manufacturers/importers trade association whose area of interest lies within the micrographics field is the Chambre Syndicale Belge des Fabricants et Agents Generaux de la Mecanographie in Brussels.

Technical Requirements

Electric current in Belgium is 220 volts, single-phase, 50 hertz. In some areas, 380 volts, 3-phase, 50 hertz current is available. All equipment plugs must have a ground connection. Belgian safety requirements and design standards tend to follow DIN (Deutsche Industrie Normen) specifications.

The metric system of weights and measures is used in Belgium. Where applicable, all equipment should be adapted to this system.

The U.S. standardized microfiche format size (105-mm. x 148mm.) has been adopted in Belgium. Belgian multiview microfiche, with a few exceptions, conforms to the NASA 60 view. The reduction ratio for letter-size documents is 1:24; for large engineering drawings, 1:30; for small drawings, reproduction ratios of 1:21 and 1:15 are common.

Silver halide film dominates the master negative microfilm market, while diazo films are used almost exclusively for duplication purposes. Vesicular (thermo) films of the Kalvar type are used only for very limited and special applications.

A loan copy of basic research report "Micrographics—Belgium," DIB 73-03-504, upon which this Export Market Digest is based, may be obtained from the U.S. Department of Commerce, Bureau of International Commerce, Washington, D. C. 20230.

Canada

An optimistic outlook prevails for Canada's micrographics market, as the Canadian economy continues its rapid expansion.

Canada's gross national product (GNP) in 1971 was about \$91 billion, an increase of \$9.1% over 1970. For 1972, the GNP is expected to register around a 10% increase, topping the \$100 billion mark for the first time.

This upward trend in the economy is expected to stimulate imports from the United States, which may exceed the 1971 level of \$10.8 billion by 15%.

Highlights

► Canada's efforts to solve severe paperwork problems should more than double the size of the country's market for micrographics equipment, supplies, and services from 1971 to 1976.

► An expected 16% yearly growth rate points to a \$34 million total market in 1976—up from \$16 million in 1971.

► Canada imports almost all of its micrographics equipment and is expected to continue to do so in the years ahead.

► U.S. suppliers account for over 95% of the Canadian market for micrographics equipment and supplies.

► Canadian courts accept microfilm documentation as legal evidence.

Widespread modernization of information systems in many sectors of the Canadian economy is sparking yearly increases in sales of micrographics equipment, supplies, and services, evidenced by the 50% rise in micrographics expenditures during the period 1968-71. These 3 years appear to have been only the prelude to an extremely bright future for the Canadian micrographics market that should be fully realized in the 1970's.

U.S. micrographics firms are in an excellent position to capitalize on Canada's urgent need to increase its information-processing power through the application of new technologies. They are recognized by Canadian users as world leaders in technology and design, and in quality, reliability, and variety of products offered. This unique hardware capability and the associated application technology give American manufacturers a decided advantage in the Canadian market.

Market Shows Sharp Growth

The micrographics market in Canada is expected to continue growing strongly in the 1970's. Total Canadian consumption of micrographics equipment, supplies, and services reached an estimated \$16 million in 1971, compared with \$10.6 million in 1968.

With virtually no production in Canada, demand is satisfied primarily through imports. The equipment segment represented about \$10 million, or 62.5%, of the 1971 total; supplies accounted for \$4 million, or 25%; and services comprised \$2 million, or 12.5% (see table 1).

As trade sources envision an average annual growth rate of 15% for both equipment and supplies and 25% for services, 1976 total consumption is projected at \$34 million, comprised of \$20.3 million, equipment; \$8.1 million, supplies; and \$5.6 million, services.

The Canadian micrographics market is dependent almost entirely on imports from the United States. The only other supplying countries are the United Kingdom, Germany, and Japan, but their combined share is less than 1% of the total market. Canada's imports of the product category from these countries have been limited primarily to peripheral items.

Specific Sales Opportunities

Canada is expected to purchase about \$128 million worth of micrographics equipment, supplies, and services during the period 1972-76. U.S. companies should supply between 95 and 98% of the total demand. Extensive market research recently conducted in Canada by the U.S. Department of Commerce reveals highly favorable prospects for American exporters of the following micrographics products:

- Rotary cameras
- Roll film readers
- Cartridge readers
- Microfiche readers
- Roll film and microfiche reader-printers
- Alphanumeric computer-output-microfilm (COM) devices
- Central mass-storage retrievers
- Duplicators
- Small microfilm processors
- Peripheral items, including inspection and editing equipment, microfilm jacket mounters, and aperture card mounters
- Supplies, including film, printout paper, aperture cards, microfilm jackets, and processing chemicals
- Conventional micrographic and COM services

Sales opportunities are by no means limited to these products. Virtually all U.S. micrographics products should find a ready market in Canada.

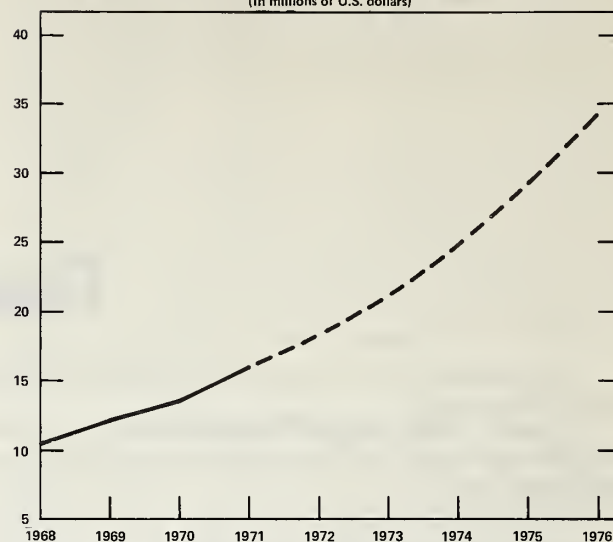
Microfilm cameras.—Cameras are the largest single segment of the Canadian micrographics equipment market. Total camera sales are expected to advance 80% over the period 1971-76, from an estimated \$4 million to about \$7.2 million, or more than a third of the micrographics equipment market.

Exceptional demand is forecast for rotary cameras in the 1970's. By 1976, the level of rotary camera sales is expected to climb to \$6.4 million, or a 30% share of the micrographics equipment market. Less impressive is the anticipated growth potential of planetary cameras and cameras with the step-and-repeat capability. Projections indicate that annual sales of each of these two types of cameras should reach nearly \$400,000 in 1976.

Microfilm readers.—Microfilm readers represent the second largest segment of the Canadian micrographics equipment market. Reader sales are expected to rise at a healthy rate of over 15% annually and reach a level of \$6.5 million in 1976, or almost a third of the micrographics equipment market.

Sales opportunities are expected to accelerate in the areas of cartridge readers, roll film readers, and micro-

Figure 1. - Size of Canadian market for micrographics equipment, supplies, and services, 1968-71, and projected 1976
(In millions of U.S. dollars)



Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on trade estimates and survey of Canadian end-users.

Note: Since local production is negligible, size of market is equal to total imports.

fiche readers. If industry predictions hold, the value of annual sales of roll film readers may represent \$3 million in 1976; roll film and cartridge readers and microfiche readers may reach a sales level of \$1.5 million each. It is estimated that in 1976 aperture card readers and micro-opaque readers will have a market of around \$400,000 each.

Microfilm reader-printers.—Reader-printer sales are expected to experience the highest growth rate of any single item of micrographics equipment. Sales should rise at an average annual rate of between 15 and 20% through 1976. According to Canadian trade sources, consumption of reader-printers is forecast to surge from \$2 million in 1971 to \$4.5 million in 1976.

Purchases of roll film reader-printers in 1976 are projected to reach \$3.3 million, or almost three-quarters of the reader-printer market.

Growing requirements are also predicted for microfiche reader-printers and aperture card reader-printers. Annual sales of microfiche reader-printers are expected to increase to \$700,000 in 1976 and to \$500,000 for aperture card reader-printers.

Computer-output-microfilm (COM) devices.—Although there are only about nine COM units now in use in Canada, the country's computer population indicates long-range possibilities for large volume sales of COM systems. Of the more than 3,500 computers currently installed in Canada, about a third are medium-to-large-scale machines. Continued rapid increase in the country's computer population is expected in the next 5 years.

The COM market is forecast to advance from an estimated \$600,000 in 1971 to about \$1 million in 1976. Canadian trade sources predict that alphanumeric units

will account for around 80% of the COM market in 1976.

Automatic retrieval devices.—Automatic retrieval devices have yet to come to the forefront, as Canadian decision-makers are more cautious than their U.S. counterparts in installing the ultramodern microfilm retrieval systems. Nonetheless, the market for these devices is expected to increase fourfold to \$400,000 by 1976, with particular interest expected to be shown in central mass-storage retrievers.

Microfilm peripheral equipment.—There is a limited demand for inspection and editing equipment, microfilm jacket mounters, and aperture card mounters. However, demand in 1976 for these peripheral items is expected to reach \$300,000, with inspection and editing equipment comprising the major share of the market.

Microfilm duplicators.—A rapid rate of expansion from its current small base is anticipated for the duplicator market during the next few years. The market for this equipment, estimated at \$100,000 in 1971, is expected to reach \$200,000 in 1976. Demand will be strongest for card duplicators; sales are projected to account for 75%, or \$150,000, of the market in 1976.

Microfilm processors.—The market for processors also seems headed for rapid expansion from its current modest base. Between 1971 and 1976, purchases of this equipment are expected to increase twofold to \$200,000. Local trade sources forecast that Canadian buyers will shop principally for small processors. Moderate sales are anticipated for large processors through 1976.

Microfilm supplies.—Supplies represent the second largest segment of the Canadian micrographics market after equipment, commanding 25% of the total. Sales of supplies are predicted to more than double during the period 1971-76—from about \$4 million to over \$8 million. Supplies with the highest sales potential in the Canadian market, with their 1976 sales potential shown in parentheses, are: Film (\$4.8 million); print-out paper (\$2.2 million); aperture cards and microfilm jackets (\$800,000); and processing chemicals (\$300,000).

Microfilm services.—Services is the fastest growing segment of the Canadian micrographics market. Based on a predicted average annual growth rate of close to 20%, the market for services is expected to approach \$6 million in 1976, up from \$2.4 million in 1971.

Modernization Steps-Up Demand

The commercial and government sectors of the Canadian economy are the two best markets for micrographics equipment, each accounting for about 20% of the country's total purchases (see table 2). Service centers, which account for an estimated 15% of total consumption, also represent top sales targets for U.S. micrographics equipment suppliers.

Other prime buyers of micrographics equipment are private industry, public utilities, and educational institutions, each accounting for around 10% of the market.

Table 1.—Canada: Sales of micrographics equipment, supplies, and services by principal subcategories, 1971 and projected 1976

(in millions of U.S. dollars)

<i>Micrographic equipment</i>		
	1971	1976
Cameras	4.0	7.2
Readers	3.0	6.5
Reader-printers	2.0	4.5
Computer-output-microfilm (COM)		
devices .....	.6	1.0
Automatic retrieval devices .....	.1	.4
Peripheral items .....	.1	.3
Duplicators .....	.1	.2
Processors .....	.1	.2
Total	10.0	20.3
<i>Micrographic supplies</i>	4.0	8.1
<i>Micrographic services</i>	2.0	5.6
Grand total	16.0	34.0

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on trade estimates and survey of Canadian end-users.

Growth markets also include medical facilities and libraries, each accounting for about 5% of all Canadian micrographics expenditures.

Analysis of regional distribution shows 55% of the micrographics market concentrated in the Province of Ontario, 30% in Quebec, 10% in British Columbia, and 5% in the prairie and maritime provinces.

Commercial.—Outlays for micrographics equipment by this sector are expected to advance over 14% annually during the next several years. Thus, annual purchases of \$3.2 million in 1971 will more than double to over \$6 million in 1976.

Canadian banking institutions are heavily loaded with paperwork problems, processing over 3.5 million documents daily. They represent not only the largest single market sector for micrographics equipment but the one with the greatest prospects for high value growth. Trade sources predict that micrographics expenditures by banks will triple over the next 5 years.

One prominent bank, which reportedly is in the process of implementing the world's largest terminal banking system, plans to spend at least \$250,000 on cameras and \$500,000 on readers and reader-printers over the next 5 years.

Among the banks considered as best prospects for advanced U.S. micrographics products are six leading Canadian banks. Ranked by assets, they are the Royal Bank of Canada, Montreal; Canadian Imperial Bank of Commerce, Toronto; Bank of Montreal, Montreal; Bank of Nova Scotia, Halifax; Toronto Dominion Bank, Toronto; and Banque Canadienne Nationale, Montreal.

The insurance industry is another leading user of micrographics equipment in Canada. However, it trails the banking industry in the application of microfilm technology. Micrographics expenditures by insurance industry members have been modest to date, with the total value of individual company installations running below the \$50,000 level.

Table 2.—Canada: Expenditures for micrographics equipment, supplies, and services by principal user sectors, 1971, and projected 1976
(in millions of U.S. dollars)

Sector	1971		1976	
	Value	Market share percent	Value	Market share percent
Government	3.2	20	7.5	22
Commercial	3.2	20	6.2	18
Service centers	2.4	15	5.7	17
Industry	2.4	15	5.0	15
Public utilities	1.6	10	3.8	11
Education	1.6	10	3.1	9
Medical	0.8	5	1.5	4
Libraries	0.8	5	1.2	4
	16.0	100	34.0	100

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on Canadian trade estimates and BIC analyses.

The Canadian insurance industry today comprises some 350 casualty insurance companies and about 240 other companies and fraternal benefit societies engaged in life insurance. Among the more progressive Canadian insurance companies which started with small and medium micrographics systems and are now ready to step up to larger units or install additional equipment are the Industrial Life Insurance Co., Quebec City; Montreal Life Assurance Co., Montreal; Manufacturers Life Insurance Co., Toronto; Sun Life Assurance Co. of Canada, Toronto; Canada Life Insurance Co., Toronto; and Metropolitan Life Insurance Co.

Other good prospects in the commercial sector of the Canadian micrographics market are major financial houses and large department stores.

Several financial houses have small microfilm installations, consisting mainly of rotary cameras and reader-printers. These firms include American Express of Canada, Ltd., United Investment Services, Ltd., and Canada Permanent Trust, all headquartered in Toronto.

The five largest department stores in Canada account for 80% of all department store business and about 10% of all retail business. Department store credit sales are about 45% of total sales, and increasing. Two large Toronto-based retail organizations with plans for major expansion over the next 5 years are Robert Simpson Co. and the T. Eaton Co. Each company plans to purchase over \$500,000 worth of rotary cameras, readers, and reader-printers.

Products with highest sales potential in the commercial market include cameras, particularly rotary type, roll film readers, microfiche readers, and roll film reader-printers.

Industrial.—Micrographics expenditures by Canada's industrial sector were placed at \$2.4 million in 1971. Demand for micrographics equipment by this sector is expected to increase at a 16% annual rate and reach a projected level of about \$5 million in 1976. Industrial end-users are heavily concentrated in the Province of Ontario.

The industrial sector, the main pillar of Canada's economy, should continue to be the principal growth

sector during the 1970's. Canada, with about 32,000 manufacturing establishments, ranks sixth in the world as an industrial nation and third on a per capita GNP basis. As in the United States, one of four employed persons earns his living in the manufacturing industries. Nearly 18% of the country's industrial output is exported. With close to 700 installations, this sector of the economy leads all others in the use of computers.

Canada's largest industries are among the country's principal users of micrographics equipment. They include the petroleum, chemical, metalworking, paper, food, automotive, and agricultural machinery industries. U.S. suppliers of micrographics equipment have a particular advantage in this Canadian market sector not only because of their technological lead and quick delivery, but also because many of the country's industrial firms are affiliates or subsidiaries of U.S. companies. These firms are prime prospects for the adoption or expanded use of U.S. micrographics equipment, supplies, and services.

Some of the leading Canadian industrial firms now using micrographics equipment are Dominion Engineering Works, Ltd., Montreal; Rio Algom Mines, Ltd., Toronto; Canadian Industries, Ltd., Montreal; BP Canada, Ltd., Montreal; MacMillan-Bloedel, Ltd., Vancouver; and Domtar Ltd., Montreal.

Industrial firms likely to adopt micrographic technology in the near future include Shell Canada, Ltd., Toronto; Imperial Oil, Ltd., Toronto; Canada Packers, Ltd., Toronto; J.M. Schneider, Ltd., Kitchener; and George Weston, Ltd., Toronto.

Canadian buyers in the industrial sector are expected to shop principally for such micrographics products as rotary cameras, and readers and reader-printers of all types, particularly roll-film type.

Government.—Purchases of micrographics equipment by the government sector are forecast to increase at an average annual rate of nearly 19%, from \$3.2 million in 1971 to \$7.5 million in 1976. These figures do not include purchases by Crown corporations such as Air Canada, Canadian National Railway, Atomic Energy of Canada, Ltd., or the National Research

Council.

The largest buyer of micrographics equipment in this segment of the market is the Federal Government. Among the Federal departments in Ottawa now using such equipment are Statistics Canada (formerly the Dominion Bureau of Statistics), Department of Labour, Department of Supply and Services, and the Department of Public Archives.

In several areas of the Federal Government there is active planning to establish data banks. Such banks are being planned by the National Research Board, Statistics Canada, and the Department of Industry, Trade and Commerce. These data banks would be micrographics equipment users and comprise an additional market potential for the product category.

The government is the second largest user of computers after the industrial sector. Some 150 computers were installed in Federal and Provincial Government departments and agencies by the end of 1971. Expenditures by the Federal Government for computing services were estimated at \$45 million in 1971; the major portion covered rental charges for computers installed in departments, and departmental operating expenses.

There is no centralized federal authority for purchasing micrographics equipment, but the central management functions on micrographics matters are, to a degree, the responsibility of the Government's Treasury Board and the Department of Supply and Services. They approve, within limits, department expenditures for micrographics operations and advise on their feasibility. They also aim to improve the role of micrographics in government service.

After the Federal Government, the most important users of micrographics equipment in this sector are the Provincial Governments of Ontario, Quebec, British Columbia, and the prairie provinces, particularly Manitoba and Alberta, in that order.

Ontario, which has the largest automatic data processing operation among the country's 10 provinces, spent about \$15 million in 1971 to operate its five EDP centers. These expenditures are expected to reach \$35 million in 1967, based on a projected 20% average annual growth rate.

Ontario's capital investment in micrographics equipment to date is placed at approximately \$250,000, of which about 31% is accounted for in cameras; 31% in readers; 25% in reader-printers; 8% in processors; 2% in automatic retrieval devices; 1% in duplicators; and 2% in other miscellaneous equipment.

Ontario Government departments with established micrographics operations include the Department of Education, Department of Highways, Department of Labour, Department of Land and Forests, and the Department of Public Works. These departments are all Toronto-based, except for the Department of Highways which is located at Downsview, Ontario.

The Manitoba Government plans to have a \$1 million educational information retrieval system in operation by 1973. It will be used to record and handle data on students, personnel, finances, educational programs, and facilities. The project, including equipment procurement, is being handled by the Manitoba Educational Department Information Access Committee.

Other Provincial Government departments or agencies with micrographics installations are the Department of Trade and Commerce in Montreal, Quebec; the Department of Education in Halifax, Nova Scotia; the Department of Municipal Affairs in Winnipeg, Manitoba; the Department of Highways in Edmonton, Alberta; the Computer Center in Regina, Saskatchewan; the Social Welfare Department in Vancouver, British Columbia; and the Division of Vital Statistics in Victoria, British Columbia.

Buying patterns in the government sector are marked by large outlays for cameras, with greatest sales growth predicted for rotary, planetary, and step-and-repeat types, in that order. Demand is expected to remain high for readers, particularly cartridge readers, followed by roll film readers and microfiche readers, with aperture card readers a poor fourth. Reader-printers are also considered as having best sales prospects, with roll film type predominating. In addition, there are excellent growth prospects for automatic retrieval devices, especially central mass-storage retrievers.

Education.—Another rapidly developing market for micrographics equipment is the educational sector, which is predicted to expand at a 14% annual rate during the years ahead. Its micrographics purchases are expected to total over \$3 million in 1976, compared with \$1 million in 1971. Regional distribution follows quite closely on the national patterns, with a slightly higher concentration in the Atlantic provinces.

Some 36 computer systems are in use in Canadian universities. The concept of regional centers with large computing facilities within individual universities has been virtually rejected by many of the country's educational institutions. The current trend in data processing is for each university to develop "tailor-made" facilities to suit its individual needs. It seems likely that this trend will also determine the purchasing pattern of micrographics equipment.

The number of universities with micrographics operations is placed at 25. It is estimated that universities in the Province of Ontario have invested about \$1.5 million in micrographics equipment. The combined investment in such equipment by all other Canadian universities is about \$2 million. Of the sector's total \$3.5 million capital investment in micrographics, about 85% is accounted for in reader-printers, 6% in readers, 5% in cameras, and 4% in other miscellaneous equipment.

Universities employing micrographics equipment for both instructional and administrative applications include the Memorial University of Newfoundland, St. John's, Newfoundland; Mount Saint Vincent University, Halifax, Nova Scotia; University of New Brunswick, Fredericton, New Brunswick; University of Prince Edward Island, Charlottetown, Prince Edward Island; University of Montreal, Montreal, Quebec; Sir George Williams University, Montreal, Quebec; McGill University, Montreal, Quebec; University of Ottawa, Ottawa, Ontario; University of Toronto, Toronto, Ontario; University of Manitoba, Winnipeg, Manitoba; University of Calgary, Calgary, Alberta; and University of British Columbia, Vancouver, British Columbia.

Medical.—Total sales of micrographics equipment to medical facilities are projected to rise over 13%

annually, from an estimated \$800,000 in 1971 to almost \$1.5 million in 1976.

Provincial hospital insurance programs cover nearly the entire population in Canada and Hospital Services Commissions pays most operating costs of hospitals. Therefore, patient billing is not an important data processing operation in Canadian hospitals. The net effect is that expenditures by individual hospitals for micrographics installations are generally below \$10,000. This makes the Canadian hospital market less lucrative than its U.S. equivalent.

The Hospital Computer Advisory Committee for the Province of Ontario has been an advocate of the concept of shared-computer facilities to meet the needs of the province's hospitals for automatic data processing. In 1968, the Hospital for Sick Children in Toronto became the site of the main time-sharing system which provides on-line services to 12 teaching hospitals in Toronto. The total budget for this data processing center, and the regional control centers in Ottawa and Hamilton, is about \$1 million per year. The Province of Saskatchewan operates a similar time-sharing system serving the needs of eight hospitals.

Among the leading hospitals with micrographics facilities are Provincial Hospital, St. John, New Brunswick; Victoria General Hospital, Halifax, Nova Scotia; Sainte-Jean de Dieu Hospital, Montreal, Quebec; Toronto General Hospital, Toronto, Ontario; Winnipeg General Hospital, Winnipeg, Manitoba; and University of Alberta Hospital, Edmonton, Alberta.

Demand in the hospital market will be strongest for readers and reader-printers, particularly microfiche type.

Libraries.—The 1971 dollar volume of micrographics equipment sales in this small end-user category is estimated at \$800,000. Based on a predicted average annual growth rate of 8.5%, this figure should reach over \$1.2 million in 1976.

Notwithstanding the trend among Canadian libraries to develop micrographics facilities appropriate to their individual needs, equipment contrasts are insignificant among the nation's business, institutional, educational, and governmental libraries. It is clearly evident that microfilm readers (all types except aperture card readers) and reader-printers (both roll film and microfiche types) now comprise the major share of micrographics installations, and are expected to continue to show greatest growth in this market sector during 1972-76. Although not yet widely used, there is a latent demand for cameras, duplicators, processors, and even for some automatic retrieval devices, to augment the limited equipment resources of the existing, predominantly small, library installations. Variations in the investment expenditures for micrographics equipment seem correlated with the number of volumes per library, with a minimum cutoff point of about 50,000 volumes.

Canadian libraries now using micrographics equipment include McGill University Library, Montreal; National Library of Canada, Ottawa; University of Toronto Libraries, Toronto; Saskatchewan Legislative Assembly Library, Regina; and British Columbia Institute of Technology, Burnaby.

Some other micrographics-using libraries that should be mentioned are Canadian Broadcasting Corporation Library and Sun Life Reference Library in Montreal and Parliamentary Library and Supreme Court Library in Ottawa.

Public utilities.—Purchases of micrographics equipment by public utilities amounted to \$1.6 million in 1971; they are expected to climb 19% annually and approach \$4 million in 1976.

Canada's power utilities are expected to expand their generating facilities substantially in the 1970's. This forecast relates directly to the projected capital investment by Canadian utilities of some \$4 billion annually through 1975 and \$7 billion annually during the second half of the decade.

Canada is second only to the United States in the production of hydroelectric power. In all sections of the country, plans for expanded generating facilities to accommodate substantially increasing demand for services from domestic, commercial, and industrial consumers are in progress.

Ontario, for example, budgeted \$600 million in 1971 for capital expenditures to increase the output of its hydroelectric system. Hydro Quebec is moving ahead with its \$5.8 billion James Bay and \$300 million Manic 3 hydroelectric projects. In Manitoba, construction of a multimillion dollar electrical power station on the Nelson River at Jenpeg is underway. British Columbia's Hydro and Power Authority has allocated \$800 million for power projects over the next 3 to 4 years. Canada's National Energy Board recently approved construction of electricity power stations valued at \$184 million near Saint John, New Brunswick.

This unprecedented growth in capital spending by provincial utility companies will generate a sharp rise in demand for new and improved machinery and equipment. This implies increasing sales prospects for micrographics equipment, as Canadian utilities are always striving to keep their information systems up to date.

Overall, this end-user category spends about 41% of its micrographics dollar on reader-printers, 27% on cameras, and 20% on readers, with the remaining 12% spread about evenly among processors, duplicators, and other miscellaneous equipment. The best export sales potential in this segment of the Canadian micrographics market lies in rotary cameras, microfiche readers, and roll film and microfiche reader-printers.

Public utility companies with micrographics operations considered prime potential customers for additional equipment include Hydro Quebec, Montreal; Hydro Electric Power Commission of Ontario, Cornwall; Manitoba Telephone System, Winnipeg; British Columbia Telephone Co., Vancouver; and Westcoast Transmission, Ltd., Vancouver.

Other principal public utility targets for micrographics sales are Maritime Telegraph & Telephone Co., Halifax; Anglo-Canadian Telephone Co., Montreal; Northern & Central Gas Corp., Toronto; Union Gas Co., Toronto; Inter-Provincial Pipeline Co., Calgary; and British Columbia Hydro & Power Authority, Vancouver.

Service centers.—COM and conventional microfilm conversion services are forecast to show almost a three-fold sales increase in the period 1971-76, or an 18.9% average annual growth rate. Total growth will be from \$2 million to an estimated \$5.7 million in that period. Service centers should, in the long term, emerge as large potential buyers of micrographics products because of the anticipated rapid increase in the country's COM film and conventional microfilm user base. This means increasing expenditures by this end-user category for modern micrographics hardware and supplies to keep pace with the rapidly rising demand for services.

Commercial COM service centers have been operating in Canada for only the past 2 years. There are now seven such centers in the country. This rapid expansion has led to an oversupply of COM services as the number of COM centers needed to fill the present demand far exceeds end-user requirements. Therefore, demand by commercial service centers for COM and ancillary equipment is expected to be sluggish for the next few years. However, in a rapidly expanding environment characterized by the computer printout explosion, COM centers should in the long term prove to be one of the fastest growing segments of the Canadian micrographics market.

U.S. suppliers have established a stronghold in this segment of the Canadian market, since all of the country's COM centers are users of American-made COM devices. Canada's seven commercial COM centers, with the type of equipment employed shown in parentheses, are COR Systems, Ltd., Montreal (KOM-90); MICR Group, Ltd., Toronto (KOM-90); London Life Assurance, Ltd., London, Ontario (3M-EBR); Reproduction Systems, Ltd. (Division of Transamerican Corporation), Toronto (SD-4440); Computrex Centres, Ltd., Toronto (PTI-1300); Computrex Centres, Ltd., Vancouver (PTI-1300); and Computrex Centres, Ltd., Calgary (PTI-1300).

In addition, there are two Federal Government departments in Ottawa that have set up in-house COM operations. They are the Department of Public Archives and the Department of Supply and Services. The former uses a KOM-90 system, and a 3M-EBR recorder is employed by the latter.

All COM units installed to date in Canada are used off-line. With the exception of MICR Group, Ltd., all COM users lease their equipment. Local trade opinion is that as much as 1% of the present Canadian computer population (3,500) is likely to add a COM recorder within the next 5 years. Canada's top 100 companies, each with annual sales exceeding \$75 million, offer a large sales potential to U.S. manufacturers of COM systems.

Trade estimates place the number of conventional microfilm processing centers in Canada at about 23. As shown below, 10 of these centers are located in the Province of Ontario, 5 in Quebec, 6 in the prairie provinces, and one each in British Columbia and the Atlantic provinces. The large-scale and more comprehensive centers are concentrated in the larger markets of Toronto and Montreal.

Atlantic Provinces

Microfilming Services, Ltd., Halifax, Nova Scotia

Quebec

DGS Microfilming Ltd., Quebec City
Bell & Howell Ltd. Montreal
Canadian Kodak Co. Ltd., Montreal
3M Company of Canada Ltd., Montreal
Xerox of Canada Ltd., Montreal

Ontario

Campbell Reproductions, Ltd., Ottawa
Preston Microfilming Services, Ltd., Toronto
Standard Microfilm Reproductions, Ltd., Toronto
Retrievox Microfilming, Ltd., Toronto
Microfilm Recording Co., Ltd., Toronto
Canadian Kodak Co., Ltd., Toronto
Bell & Howell, Ltd., Toronto
3M Company of Canada, Ltd., Toronto
Xerox of Canada, Ltd., Toronto
Microfilm Services, Ltd., Windsor

Prairies

West Canadian Graphics, Ltd., Winnipeg, Manitoba
Xerox of Canada, Ltd., Winnipeg, Manitoba
West Canadian Graphics, Ltd., Saskatoon, Saskatchewan
Orhans Products, Ltd., Calgary, Alberta
West Coast Graphics, Ltd., Calgary, Alberta
West Coast Graphics, Ltd., Edmonton, Alberta

British Columbia

West Coast Graphics, Ltd., Vancouver

Legal Aspects of Microfilm

The Canada Evidence Act provides that microfilm documentation is admissible evidence in courts of law if the original document is not available.

In addition, the courts in the following provinces accept records on microfilm as a means of proof or evidence: Alberta, British Columbia, Manitoba, New Brunswick, and Ontario.

In an effort to achieve uniformity of codes governing the legal aspects of microfilm, the Canadian Micrographics Society has submitted a draft microfilm code to the Canadian Attorney-General and the 10 provincial Attorneys-General.

Competitive Environment

Imports of micrographics equipment, supplies, and services from the United States now represent 95 to 98% of total Canadian consumption. Except for a very small quantity of microfilm cameras and supplies, there is virtually no local production of micrographics equipment in Canada. It is unlikely that there will be any material change in the market share of local producers during the next several years because the Canadian market does not offer the volumes necessary to achieve economies-of-scale that would justify the cost of setting up local production facilities.

Competition from "foreign" manufacturers is negligible and does not present any significant competi-

tion to U.S. producers. Britain, Germany, and Japan are selling some peripheral items but are not firmly established in Canada. Their combined share is no more than 1% of the total market.

Several factors contribute importantly to maintenance of the dominant U.S. position in the Canadian micrographics equipment market. Having pioneered and developed the widest range of micrographics equipment in the world, U.S. manufacturers generally possess a superior technological capability and a marked time advantage in placing new products on the market. Large scale production has permitted U.S. makers to set competitive export prices in spite of relatively high labor costs. The close proximity of the American producer generally permits the Canadian customer to obtain prompt delivery and effective after-sales service.

Another important U.S. competitive advantage is the presence of vast American capital investment in Canada. The United States accounted for about 82% of all direct foreign investment in Canada in 1968, totaling \$22.5 billion. Because of these factors, U.S.-made micrographics equipment is generally favored by Canadian purchase decision-makers.

Four major U.S. micrographics equipment manufacturers hold the lion's share of the Canadian market. They are Kodak, 3M, Bell & Howell, and Xerox. These four firms sell directly to end-users through wholly owned Canadian subsidiaries. Several dozen other U.S. manufacturers, either acting on their own or through local representatives, account for most of the remaining 11% of the market.

Except for Canadian Kodak Co., Ltd., which produces a very small quantity of microfilm cameras and supplies at its Toronto plant, no manufacturing subsidiaries of U.S. companies produce any product within the product category in Canada. In addition, no known local manufacturers produce micrographics equipment in Canada under license from U.S. companies.

Canadian import duties levied on micrographics equipment and film include the following rates: Microfilm printing and processing equipment and parts, microfilm projectors, readers and viewers, and microfilm reader-printers enter free of duty. Cameras and parts are dutiable at 15%, while microfilm, whether exposed or unexposed, would be dutiable at 17½%. In addition, imports would be subject to the general sales tax of 12% imposed on a wide range of products whether imported or produced in Canada. There are no quantitative or general import restrictions on Canadian imports of products within the micrographics category.

As a member of the British Commonwealth, Canada has participated in Commonwealth preferences. However, since the United Kingdom is now a member of the

European Common Market, U.K. preferences most likely will be abolished on a selective basis in 1973.

Detailed information about Canada's foreign trade regulations is available in the U.S. Department of Commerce publication, Foreign Trade Regulations of Canada, OBR 70-20, July 1971.

Technical Standards

Electrical characteristics in Canada are the same as commonly found in the United States: 60 hertz; 110/120, 115/230, and 120/240 volts; single phase; 2 or 3-wire connections to the secondary distribution system.

To be acceptable, electrical products and equipment must conform to the Canadian Electrical Code. No test requirements or standards apply to micrographics equipment, but U.S. manufacturers must file for approval with the Canadian Standards Association, Standards and Certification Division, 178 Rexdale Boulevard, Rexdale, Ontario.

Microfilm size preference is concentrated almost exclusively in the 16mm. and 35mm. range; the 16mm. accounts for about 80% of total Canadian microfilm consumption.

Canadian trade sources estimate that silver halide type film accounts for about 70% of the total film market. Diazo and vesicular (thermo) type films each have a 15% market share.

Canadians have adopted the U.S. standardized microfiche frame size and formats. In Canada, the standard 105 x 148mm. microfiche contains 63, 98, or 208 document-page images. For the 98-page format, Canadians are using a 24:1 reduction ratio, and a 42:1 reduction ratio for the 208 page format. The 98-page and 208-page formats each account for about 40% of the total microfiche market, and the 63-page format for the remaining 20%.

The reduction ratio normally used in Canada for recording ordinary letter-size or legal-size documents is 24:1. For engineering drawings, the reduction ratios most commonly used are 24:1, 29:1, and 30:1. Of these three ratios, the one most often used is 30:1 (50%), followed by 29:1 (30%), and 24:1 (20%).

A loan copy of basic research report, "The Market for Micrographics Equipment, Supplies and Services in Canada," DIB 72-09-503, October 1971, upon which this Export Market Digest is based, may be obtained from the Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

Denmark

Although a small country of only about five million people, Denmark is a good market for U.S. micrographics products.

Micrographics sales have almost tripled from a modest base of \$740,000 in 1968 and should triple again in the next 4 years.

No micrographics equipment or supplies are now produced in Denmark, and no production is foreseen. Imports will continue to meet Denmark's requirements for micrographics, and American manufacturers are expected to supply most of these products.

Highlights

► Sales of micrographics equipment and supplies in Denmark are expected to triple by 1976 over the \$2.1 million of 1972.

► Direct exports of micrographics products by U.S. manufacturers supply half the Danish market; much of the remainder is supplied by European subsidiaries or affiliates of U.S. companies.

► Banks and government agencies, followed by industrial corporations, are the best customers in Denmark for micrographics equipment. Hospitals and insurance companies also are excellent sales prospects for micrographics in the years ahead, despite present limited purchases.

► Computer-output-microfilm (COM) equipment sales in Denmark should expand rapidly from the single recorder now in use. COM sales between 1972 and 1976 are expected to total about \$1.9 million.

Banks now are the leading users of micrographics equipment in Denmark. Insurance companies soon are expected to begin using microfilm equipment, including computer-output-microfilm (COM) recorders. Several government agencies have been using microfilm; some of the work is being done under contract by service centers. The government is expected to buy more of its own equipment and to introduce advanced systems into its agencies and departments.

While industrial corporations have been limited users of microfilm, considerable sales growth is forecast through 1976. Two hospitals have been experimenting with microfilm systems and as many as eight may install micrographics before 1976.

Market Opens for Micrographics

Starting from a low base of \$740,000 in 1968, micrographics sales in Denmark totaled \$1.6 million in 1971 and increased to over \$2.1 million in 1972. Sales of equipment accounted for about 68% of this market, and sales of microfilm and other supplies comprised the remaining 32%. In 1976, when sales are expected to exceed \$6.1 million, supplies may account for about 37% of the market because of more extensive use of equipment and advanced microfilm systems (see table 1). Use of COM equipment will expand rapidly, from only one system now in use to a total of about \$2 million worth of equipment in use by 1976.

There are no companies in Denmark that manufacture either microfilm equipment or supplies. U.S. corporations supply about 50% of these imports, followed by British corporations with 33%, although some of these British corporations are subsidiaries or affiliates of U.S. companies (see table 2). Of the approximately \$19 million worth of micrographics products expected to be imported into Denmark from 1972

through 1976, about \$10 to \$11 million worth should come from U.S. manufacturers.

Specific Sales Opportunities

An extensive study recently conducted in Denmark for the U.S. Department of Commerce shows that sales potential is highest for readers and for COM devices (see table 4). Items identified as most salable are:

- 16mm. microfiche readers
- 16mm roll film and cartridge readers
- COM equipment compatible with microfiche systems
- Electrostatic reader/printers
- 16mm. cameras
- Electrostatic paper

Readers.—Sales potential in Denmark is higher for readers than for any other type of micrographics equipment. Increasing at a predicted average annual rate of 40%, sales of readers in 1976 may well reach \$1.6 million as compared with 1971 sales of only \$300,000. Microfiche readers and roll film and cartridge readers (both 16mm.) probably will account for the largest increases in dollar volume.

Potential buyers have shown particular interest in lower-priced microfiche readers with an acceptable image quality. Banks, government agencies, and larger industrial companies plan to convert to additional micrographics systems within the next 5 years, stimulating purchases of as many as 100 to 200 readers at a time.

Reader/printer.—The ratio of reader/printer sales to total consumption of micrographics equipment and supplies is high in Denmark, probably due to a prefer-

ence for hard copies. Danish users bought \$260,000 worth of reader/printers in 1971, and sales could accelerate to \$750,000 annually by 1976. Highest sales potential is for electrostatic reader/printers.

Cameras.—While total camera sales are expected to more than double during the 1971-76 period, going from \$340,000 to \$760,000, most will be of 16mm. cameras. Although approximately half of the 16mm. cameras now sold in Denmark are of the less expensive type, sales of medium-price, medium-quality cameras are expected to increase and could account for about 50% of all the 16mm. cameras forecast to be sold to Danish customers in 1976.

The market for 35mm. cameras, those designed mainly for reproducing large documents such as engineering drawings, will stabilize at about \$30,000 per year between now and 1976. Because Denmark has relatively few engineering firms and many of its manufactured goods are made under license, reproduction service centers fill the needs of most companies for 35mm. micrographics. Danish requirements for step-and-repeat cameras are limited, with only four or five such cameras now in use; minimal sales of these cameras are expected during the 1970's.

Processors.—The market for processors is small and "captive" at this time; most users are buying the processor recommended by the manufacturer of the cameras they purchase. Sales, negligible in 1971, may reach \$130,000 in 1976.

Duplicators.—Sales of duplicators, now very low, will rise as more COM recorders are sold. Duplicator sales could amount to \$130,000 in 1976.

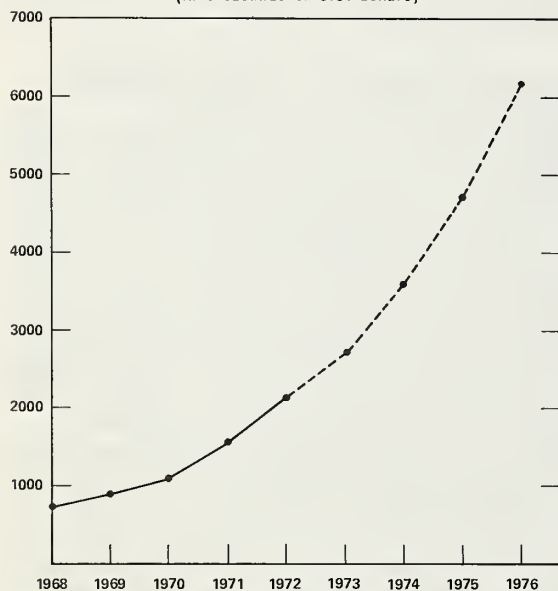
Computer - output - microfilm (COM) devices.—TK Data, a service bureau, has the only COM installation in Denmark—a Pertec COM recorder—leased through the manufacturer's local agent in Malmo. The COM concept, however, should gain much wider acceptance during the next 4 to 5 years, with sales totaling \$1.9 million during that period. At least a dozen Danish concerns are known to be studying COM systems as a means of handling large volumes of paperwork.

The potential Danish buyer is considered likely to be most interested in low-cost, small capacity off-line COM equipment with microfiche capabilities. During the 1971-76 period, COM systems may be sold as follows: Three or four to banks, three or four to insurance companies, and two or perhaps three each to service bureaus, the government, and industry.

Automatic retrieval devices.—Most firms in Denmark are considered not large enough to justify the purchase of automatic retrieval equipment; therefore, few sales of these systems are foreseen in the near future.

Supplies.—Increased investment in and use of micrographics equipment will spur further purchases of microfilm supplies, which may rise to approximately \$2.3 million in 1976. Kodak and 3M are active in this market, exporting paper and film to Denmark from their plants in the United States as well as in Europe. The German firm, Agfa Gevaert, also sells large volumes of micrographic supplies, most of which are manufactured in Belgium. Because of the high growth rate forecast for sales of COM systems and electro-

Figure 1. — Denmark: Micrographics equipment and supplies market, 1968-72; and projected 1973-76
(in thousands of U.S. dollars)



Note: Size of market equals total imports, in absence of local production and exports.

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Danish trade estimates and survey of Danish end-users.

Table 1.—Denmark: Sales of micrographics products, 1971, and projected 1976

(in thousands of U.S. dollars)

Micrographics equipment	1971	1976
Readers	300	1,600
Cameras	340	760
Reader/printers	260	750
Computer-output-microfilm (COM) devices	100	300*
Peripheral items	80	180
Duplicators	—	130
Processors	—	130
Total	1,080	3,850
Micrographics supplies	500	2,300
Grand total	1,580	6,150

* Forecast at \$500,000 in both 1974 and 1975.

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Danish trade estimates and survey of Danish end-users.

static reader/printers, it is likely that there will be a rapid increase in the demand for diazo film and electrostatic paper in Denmark.

Services.—Service bureaus in Denmark should be generating revenues in excess of \$1.6 million annually by 1976. COM service sales should total about \$750,000, conventional service sales should total \$600,000, and micropublishing sales could total almost \$250,000. COM services will expand rapidly from the 1971 level of only \$70,000, while conventional services will double from the 1971 level of \$300,000.

Micrographics Acceptance Increases

The market for micrographics in Denmark is concentrated mostly in and around the capital city of Copenhagen. Banks now account for 28% of the country's purchases of micrographics equipment, and their expenditures in this field will continue to increase over the next few years.

Government agencies, which purchase 30% of all the micrographics products sold in Denmark, are very progressive in their applications of microfilm technology.

Industrial users account for 20% of micrographics consumption, but growth potential here can be high, particularly as some of the larger firms become aware of the advantages of micrographics.

Insurance companies, now accounting for only 2% of sales, could well become significant users in coming years. Service centers expect an upsurge in demand, especially for COM services, and will require additional equipment and supplies.

Denmark's other markets for micrographics equipment, including research institutes and libraries, may have relatively limited sales potential in the near future, but several hospitals are considering the purchase of microfilm equipment in the near future.

Commercial.—There are 87 commercial banks in Denmark, three of which account for a little more than 50% of all commercial banking. These three banks, the Copenhagen's Handelsbank, the Danske Landmandsbanks, and the Privatbanken, have a total of nearly 650

branches. All use microfilm to record and store information. Using large cameras at their main offices and smaller portable cameras at their branch offices, they film all checks and payment orders. These banks are now investigating the advantages of COM systems for transmitting centrally processed information between offices and are expected to buy COM equipment before 1975.

Copenhagen's Handelsbank (Holmens Kanal 2, 1060 Copenhagen K), with assets of \$1.9 billion and 270 branches, is Denmark's largest commercial bank. The main office and the larger branches use Kodak Reliant cameras, models 400, 500, and 600. The smaller branches use portable Recordak cameras; this bank has approximately 100. A service center develops the microfilm, which is then read on 3M readers owned by the Handelsbank.

The Privatbanken (Borsgade 4, 1249 Copenhagen K), with assets of \$1.1 billion and 175 branches, uses equipment similar to that of Copenhagen's Handelsbank. In addition, it recently set up a jacket system for customer files, for newspaper clippings, and for credit information. This bank uses 15 portable Recordak cameras and 10 Kodak Reliant cameras, models 500 and 600, for these operations.

Den Danske Landmandsbank (Holmens Kanal 12, 1060 Copenhagen K), with \$1.64 billion in assets and approximately 200 branches, now uses micrographics only for microfilming checks, including travelers' checks.

Savings banks also play an important role in Danish finance. At the end of 1967, the country's 200 major savings banks had assets totaling about \$2.5 billion. Many of these banks cooperate closely and have organized the Sparekassernes Datacentraler (SDC), a shared electronic data processing center located in Copenhagen. SDC uses microfilm only for checks, but by the end of 1973, influenced in part by the recent action of its Swedish counterpart, SDC probably will install a COM system. This could mean the purchase by member savings banks of more than 1,000 readers in 1974 and 1975.

The Bibuken Sparekasse (Silbegade 8, 1113 Copenhagen K), Denmark's second largest savings bank, with assets of \$464 million, has not yet joined the SDC and has its own EDP on-line teleprocessing network. This bank uses one large Bell & Howell camera and several portable Kodak Recordak cameras to microfilm checks and deposit and withdrawal slips.

The third largest savings bank, Sparekassen Fyn (Fisketirvet 8-10, 5000 Odense), uses 17 Minima Duplex cameras, made by Microfilm Fotostat SpA of Milan, Italy.

Insurance companies are expected to utilize micrographics technology to a great extent within the next 2 or 3 years. It is believed that COM recorders and jacket systems for customer's files will be in wide use. After experimenting with COM techniques by using a service bureau, the four or five largest firms will probably buy their own COM equipment. Smaller insurance companies, however, probably will use service centers to meet their micrographics needs.

Previous reluctance among insurance companies to use micrographics techniques was the result of the un-

Table 2.—Denmark: Value and market share of imports of micrographics equipment and supplies by country of origin, 1968-71

(in thousands of U.S. dollars)

	1968		1969		1970		1971	
	Value	Market share percent	Value	Market share percent	Value	Market share percent	Value	Market share percent
United States	345	47	400	45	510	48	800	51
United Kingdom	220	30	325	36	360	33	525	33
Other	175	23	175	19	200	19	255	16
Total	740	100	900	100	1,070	100	1,580	100

Source: U.S. Department of Commerce, Bureau of International Commerce market research study.

certain legal status of microfilmed copy and the relatively low cost of storing and handling the original documents. The increasing volume of business and the sharply rising cost of clerical and administrative help, however, are forcing insurance firms to consider streamlining their procedures by means of micrographics technology. Most insurance companies already are users of sophisticated EDP systems and therefore are likely sales prospects for COM systems.

Potential customers for COM equipment include the following five insurance companies, all headquartered in Copenhagen: Statsanstalten For Livsforsikring, Pensionsforsikringsanstalten A/S, Nordisk Livsforsikrings A/S Hafnia, Skandinavia Selskaberne, and Meferiernes Og Landbrugets Ulykkesforsikring G/S (MLU).

MLU is one of Denmark's largest auto insurers and the only such company already using microfilm. A jacket system is used for all MLU policies (their gross premiums add up to \$39 million annually); it is operated with four Kodak Reliant 600 cameras and Kodak SP3 and Kodak Microstar readers.

Another prospect for COM equipment is OK Data, a subsidiary of East Asiatic, the leading trading company in Scandinavia. Involved in industrial and agricultural activities as well as shipping, East Asiatic has 109 branch offices throughout the world and annual gross receipts of \$1.42 billion. OK Data provides electronic data processing services to its parent company and to other companies in Denmark. OK Data may decide to purchase a COM recorder late in 1973.

Government.—Government agencies are the largest and most progressive users of micrographics, accounting for 30% of Denmark's total market. For example, the Postgiro, a postal banking office similar to those found in many other European countries, soon will adopt a microfilm system similar to the one used by the Swedish Postbanken. By 1975 or 1976, all savings account deposit and withdrawal slips, all orders to transfer payment between checking accounts, and all daily statements of accounts will be put on microfilm. The Postgiro now uses a Kodak Reliant 600 camera to microfilm checks.

The Ministry of Pensions, on the other hand, microfilms checks and all records of employee contributions and has the microfilm developed by a service bureau. The Ministry of Pensions may begin to use a COM system and expects to contract for additional work with a COM service center in the near future.

The Ministry of Defense uses two 35mm. planetary

cameras and processors to microfilm technical drawings and weather maps for storage on aperture cards.

Various federal and local agencies have established a nonprofit electronic data processing center called Datacentralen, located at Ved Stadsgraven 15, 2300 Copenhagen S., which now uses a COM service center but is expected to buy its own COM recorder late in 1973. Datacentralen already has contracts with a COM service bureau to microfilm the updating of population statistics, the updating of street directories, and the payroll records of the Post and Telegraph service.

The municipal governments of Copenhagen and of Alborg-Norresundby use 16mm. systems to microfilm incoming and outgoing correspondence. They also use combination jackets, which hold both 16mm. and 35mm. film, to record applications for building permits and the action taken on each one. Other large cities, such as Aarhus and Odense, are expected to follow this practice in the near future.

The Danish Police Records Department (DPRD) will become a user of micrographics should it adopt the advanced techniques now employed by its counterpart in Sweden. That system includes the storage of microfilmed information on cassettes or on aperture cards, coded so that electronic data processing equipment can locate it quickly. Passport applications, fingerprints, criminal records, and records of crimes would be filed in this way.

Industrial.—Industrial production comprised 42% of Denmark's gross national product in 1971. The largest capital expenditures have been in the engineering (metals, machinery, and electronics), chemical, plastics, and food processing industries. Industries with strong export potential are particularly mindful of the need to modernize and remain competitive. Industrial users now account for 20% of the total Danish market for micrographics products, with applications limited mainly to reproduction and storage of technical drawings.

Much of the work is done by service centers, because many small firms feel that requirements do not justify investing in their own equipment. For example, F. L. Smith & Co. A/S, (Vigerslev Alle 77, 2500 Valby), Denmark's sixth largest industrial firm, with sales of complete cement factories and machinery totaling \$100 million, has been using a service center to microfilm technical drawings. Recently, however, this company bought a Microbox 35mm. planetary camera and some Microbox readers from Mikrodan A/S, an agent for Microbox and Bell & Howell, to put engineering draw-

Table 3.—Denmark: Value and market share of micrographics consumption by principal user sectors, 1972
(in thousands of U.S. dollars)

Sector	Value	Percent
Government	642	30
Commercial	642	30
Industrial	428	20
Others	428	20
Total	2,140	100

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values and market shares based on trade estimates.

ings on microfilm aperture cards.

A/S Buremeister and Wain (Torvegade 2, 1400 Copenhagen K), the largest firm in Denmark's important shipbuilding industry, also microfilms its technical drawings for storage in aperture cards, using a 35mm. system consisting of a Kodak MRG planetary camera, two Rank Xerox 1824 printers, a Caps microfilm printer, and readers made by Caps and by 3M.

Among other Danish firms using micrographics equipment are Bang and Olufsen A/S, Dansk Esso, and Ford Motor Co. A/S.

Denmark's five largest industrial corporations are Supefos A/S (chemicals), Plumrose A/S (foods), Danfoss A/S (industrial components), Carlsberg-Tuborg Bryggerier (brewery), and Forenede Sjdellandske Andelsslagterier (meat products). All have annual sales of between \$100 and \$200 million. None of these are microfilm users, but they are believed to be potential buyers of 16mm. microfilm equipment.

Transportation.—Two publicly owned transportation firms are micrographics users. De Danske Statsbaner A/S (Danish State Railways, headquartered at Solvgade 40, 1307 Copenhagen) has its timetables microfilmed by a service center so that its information staff, using 26 readers, can answer questions about train schedules. Freight bills are also microfilmed by a service bureau.

Scandinavian Airlines System (SAS) has micrographics equipment in its Stockholm offices for microfilming parts catalogs and maintenance manuals. Its office in Copenhagen contracts with a service center to microfilm selected documents and data. Sterling Airways, one of the world's largest charter airlines, uses about 150 3M readers and reader/printers to handle the equipment service manuals sent to them in cartridge form from the United States.

Medical.—Several hospitals now use microfilm for security purposes, with production work contracted out to service centers. Several Danish hospitals are interested in setting up jacket microfilm systems for patient records.

Denmark's largest hospital, the 2,400-bed Righospitalet (University Hospital), in cooperation with a micrographics manufacturer, is using a jacket system on a 1-year trial basis. The Herlev Hospital, scheduled to open soon in Copenhagen, is also studying the possibility of a jacket system. By 1976, eight to 10 hospitals are expected to have adopted microfilm for maintaining patient records.

The Directorate of Copenhagen's Hospitals is respon-

sible for the Herlev and certain other hospitals and would be an appropriate sales contact. It has offices at Karl Nielssens Alle 9, Copenhagen.

Education.—Educational institutions in Denmark have not felt the need to spend their limited funds on micrographics equipment, apart from an occasional reader or reader/printer, which university libraries use to read newspapers in microfilm rolls or microfilmed U.S. materials. Market analysts do not foresee any significant change here during the next 5 years.

Libraries.—Per capita readership of books, newspapers, and periodicals is high in Denmark; daily newspaper circulation per thousand inhabitants in 1965 was 347, higher than the rates in France, West Germany, or the United States.

Most of the larger libraries, such as the Royal Library (Christians-brygge 8, 1219 Copenhagen K) and the Hovedbiblioteket (Kultorvet 2, 1175 Copenhagen K), use microfilm readers and reader/printers both for roll films of foreign newspapers and for material received on microfiche from the United States.

Danish libraries also use microfilm to photograph the borrower's library card, together with the book card, at the time a book is taken out. Readers are then used to determine which books are overdue.

At this time, the market for micrographics among libraries is relatively stable; most expenditures are for supplies.

Research centers.—Suppliers interested in selling micrographics equipment, supplies, and services to Danish research institutes could contact the Danish Academy for Technical Services (Akademiet for Tekniske Videnskaber), a privately sponsored organization which coordinates industrial and scientific research. More than 400 Danish firms and organizations are members of the ATV, which receives some State support. The University of Copenhagen and the Federal university at Aarhus both do basic scientific research, while government-sponsored technical research is centered at the Technical University of Denmark, located in Copenhagen.

Service centers.—Denmark now has five conventional micrographics service centers and one COM service center. Two more COM service centers are in the planning stages. In addition, a recently established COM service center (Data Administration A/B, Styrsgatan 4, 20013 Malmo) in nearby Malmo, Sweden, is in a position to serve the Danish market.

Danish demand for micrographics services is expanding rapidly. Annual sales of microfilm services are expected to rise sharply during the next few years, possibly amounting to more than \$1.6 million by 1976. Of this amount, \$750,000 would be for COM services, \$600,000 for conventional services, and the remainder expected to be for micropublishing.

Smaller Danish companies often feel that investing in their own micrographics equipment would not prove economical and therefore use service centers. Some businesses also prefer to buy microfilm services for a few years before making equipment purchases.

Minerva Mikrofilm A/S, established in 1956, is Denmark's oldest conventional service center. It is located at Ehlersvej 27 in the city of Hellerup (postal

code 2900), on the outskirts of Copenhagen. Minerva's principal customers are newspapers. Its equipment consists of a Kodak MCG 35 mm. planetary camera, model 600; a Kodak Reliant camera, model 600; a Reliant portable camera; and a second 35mm. planetary camera. Minerva also occasionally sells Kodak readers and reader/printers.

Nova Mikrofilm A/S (gl. Kongevej 3, 1610 Copenhagen V) is a conventional service center which has a branch office in Odense, in addition to its main office in Copenhagen. Its equipment includes two Kodak MRD 2 planetary cameras, a Microbox 35mm. camera, and some readers manufactured by Caps Microfilm Ltd. (United Kingdom). Nova also is a sales representative for Caps and is one of Bell & Howell's two Danish sales agents.

Three other micrographics sales agents which also operate service centers are Kodak A/S (main offices at Roskildevej 16, 2620 Albertslund); Christian Bruhn, agent for Canon (Vester Volgade 83, 1552 Copenhagen V); and Mikrodan Mikrofilm-Systemer A/S, an agent for Bell & Howell and Microbox GmbH (Hesselogade 39, 2100 Copenhagen O). Mikrodan has Microbox 35mm. planetary cameras, a Bell & Howell Direktors camera, and a Bell & Howell Dataflo camera.

TK Data (Aurehøjvej 15, 2900 Hellerup) is Denmark's only COM service center and, to date, is the nation's only user of COM equipment. Its headquarters are in the Copenhagen area, and it plans to open a branch office in Aarhus. TK Data's customers are mainly government ministries and agencies, but this is expected to change when the government-owned EDP center, Datacentralen, installs its own COM recorder. However, TK Data expects to expand its service for new customers in commerce and industry. TK Data leases a Beta 600 off-line COM recorder and a Pertec off-line COM recorder. Typical charges for 16mm. COM services are \$0.21 per frame and \$0.25 per copy, with quantity discounts applying. Kodak may enter the market shortly, offering its own COM service center.

Micropublishing.—No micropublishing is being done in Denmark at present; one reason is the limited usefulness of material published in the Danish language. However, Esselte System AB, a Swedish firm, is considering entering the Danish micropublishing market, and sales of this type of service could total \$250,000 by 1976.

Legal Status of Microfilm

Microfilmed documents cannot be accepted as legal evidence in Denmark, but, at the discretion of the judge, they can be accepted as an indication of proof. Micrographics manufacturers represented in Denmark are planning to organize an association. One objective of the association would be to lobby for legislation which would make microfilmed documents admissible as legal evidence under certain conditions. A number of other countries have adopted similar legislation.

Danish law now requires that most commercial documents be kept in original form for 5 to 10 years, and that real estate documents be kept indefinitely.

Competitive Environment

All micrographics equipment and supplies required by Denmark are imported. About half of these products are imported directly from U.S. plants and about 33% of the products are shipped directly from British factories. The remaining 17% of these imports come from West German, Belgian, Italian, and French suppliers.

Official foreign trade statistics tend to underestimate the amount of U.S. micrographics equipment being sold in Denmark. U.S. equipment frequently is assembled in Europe or modified there to operate with the voltages and frequencies found in Europe. In addition, many imports from European countries actually come from subsidiaries of U.S. corporations. In this broader context, it can be said that U.S. micrographics corporations supply most of the Danish market. In the future, U.S. companies should continue to increase their sales in Denmark, especially of COM recorders and other advanced types of microfilm equipment.

Import Tariffs To Change

Denmark is a member of the GATT (General Agreement on Tariffs) and will soon leave the European Free Trade Association (EFTA) in order to join the European Economic Community (EEC). After that, the EEC common external tariffs will apply to Danish imports for non-EEC countries. The present EFTA tariffs for imports from non-EFTA countries are 5% of the c.i.f. value for readers, reader/printers, duplicators, and processors, and 15 cents per kilogram for microfilm in roll form. There is no import tariff for microfilm cameras.

Sales Development

There are nine distributors of micrographics equipment and supplies in Denmark. Three of these are subsidiaries of U.S. manufacturers (Kodak, 3M, and Memorex), one is a subsidiary of a British firm (Rank Xerox), and one is of a West German supplier (Agfa Gevaert). Four others are agents for American, British, German, and Japanese product lines.

Esselte Papir A/S distributes the products of Pertec Inc., Microform Products, and Image Systems, Inc., and Mikrodan Mikrofilm-Systemer A/S represents Bell & Howell and the West German Microbox GmbH. Nova Microfilm A/S is an agent for Bell & Howell and also for Caps Microfilm, Ltd., a British manufacturer. Christian Bruhn, a recent entrant in the market, represents Canon, the Japanese firm. Each distributor has its main offices and, in some cases, a showroom in the Copenhagen area. Denmark's geographical compactness enables salesmen to cover other Danish cities easily from Copenhagen.

Many micrographics manufacturers also exhibit at trade fairs in order to promote their products. The International Office Machinery Fair (International Kontorudstilling) is held in Copenhagen in the fall of every third year. The next such fair will take place in September 1975. Foreign firms desiring to participate must be represented by a Danish agent.

Most firms also exhibit at the Swedish Office Equipment Fair (KontorData), held every 2 years in Stock-

holm. The next KontorData fair is to be held October 4-11, 1973.

Brochures and other materials used at trade fairs need not be prepared in Danish or Swedish because English is widely read and understood. It would be desirable, however, to express measurements and other specifications in metric terms where applicable.

Danish trade journals in which a U.S. supplier of micrographics might consider advertising include: *Kontornyt* (Office News), Egegardsvej 13-15, 2619 Kodovre; *Kontorbladet* (Office Magazine), Kogevej 28, 2630 Tastrup; and *Management*, which carries articles on subjects of general interest to executives, located at Skelloekgade 4, Copenhagen V. U.S. publications, such as *Datamation* and the *International Micrographics Congress Journal*, also are read in Denmark.

Except for the two COM recorders now in use in Denmark, all micrographics equipment is purchased outright. There is no tax advantage to leasing equipment in Denmark.

Sales markups seem to range in the area of 30 to 40%. Payment is usually made within 30 days of delivery. In Denmark, government agencies normally receive a 10% discount and easier payment terms. Sometimes, other large customers receive similar concessions.

Warranties are usually 1 year for parts and labor, provided the recommended films and supplies have been used. Maintenance is usually arranged under separate contract.

A micrographics trade association for Denmark was

expected to be organized in early 1973. Other organizations which may be of help to the newcomer include: the Association of Danish Import Agents, Borsen, 1217 Copenhagen, the Danish Chamber of Commerce, Foreign Trade Section (Grosserer-Societet), also located at Borsen, 1217 Copenhagen K; and the Federation of Danish Industries (Industriraadet), 18 H.C. Andersen Boulevard, 1553 Copenhagen V.

Technical Standards

Denmark uses the metric system of measurement, and all equipment should be adapted to the metric standard where applicable.

Electrical current in Denmark is either 220-volt, single-phase, or 380-volt, 3-phase, depending on the installation. All current is 50 hertz.

The standard microfiche is 105mm. x 48mm., 60 document-page images. The dominant film sizes are 16mm. and 35mm.; 105mm. is seldom used; 70mm. is not used at all.

The most common reduction ratios are 24:1 for documents, 30:1 for large engineering drawings, and 21:1 or 15:1 for smaller drawings.

A loan copy of basic research report "Micrographics—Denmark," DIB 73-03-507, upon which this Export Market Digest is based may be obtained from the Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

France

Micrographics technology is rapidly being adopted in most sectors of the French economy. Demand for micrographics equipment is growing under the stimulus of general economic expansion, consolidation of industries, and a trend toward modernization of information handling.

Sales from 1973 through 1976 are expected to reach a total of \$55 million. U.S. firms have long supplied 50% or more of France's micrographics import requirements and are expected to retain this share at least through 1976.

Highlights

► The French market for micrographics equipment and supplies is expected to reach an annual level of \$16.5 million by 1976, a 74% rise over the 1972 figure of \$9.5 million.

► Imports, now supplying about 65% of the market, are expected to increase to \$10.5 million in 1976 from the \$6.2 million in 1972.

► U.S. sales of micrographics in 1971 reached \$2.7 million, or 57% of the import market.

► Computer - output - microfilm (COM) systems in use are expected to increase threefold, from 20 in 1972 to 60 by 1976.

► Outlays for readers and reader/printers during the period 1973-76 are forecast at over \$6 million for readers and \$7 million for reader/printers.

► Commercial enterprises are France's biggest buyers of micrographics equipment; banks lead the way.

Market Shows Rapid Growth

The French market for micrographics equipment and supplies more than doubled from \$4.6 million in 1968 to \$9.5 million in 1972 and, growing at 15% a year, is expected to reach \$16.5 million in 1976 (see figure 1). Sales of equipment accounted for \$5.5 million, or 58% of the market in 1972; supplies made up the remainder of the \$9.5 million total. Projections show a market of \$9.5 million for equipment in 1976, and \$7 million for supplies.

Imports of micrographics equipment and supplies amounted to \$6.2 million in 1972, or 65% of the market, representing a 29% increase over the 1971 level of \$4.8 million (see table 1). Imports are expected to reach \$10.5 million in 1976.

Increasing French needs for the more advanced micrographics products resulted in the U.S. import market share rising from 50% (\$1.4 million) in 1968 to 56% (\$2.7 million) in 1971 (see table 2). Germany, the second largest foreign supplier of micrographics products to France, accounted for \$1.6 million, or 34% of the French import market in 1971. If U.S. suppliers maintain their current approximate shares of the French import market, annual U.S. sales of micrographics products to France should total about \$6 million in 1976.

Specific Sales Opportunities

Market research recently conducted in France for the U.S. Department of Commerce reveals highly favorable prospects for American exporters of the following micrographics products:

- 16mm. rotary cameras
- Medium-price microfilm readers
- 16mm. electrostatic microfilm reader/printers
- Duplicators
- Medium-price, on-line and off-line computer-output-microfilm (COM) devices
- Supplies

Cameras.—Camera sales are expected to grow from an annual total of \$950,000 in 1972 to \$1.4 million in 1976 (see table 3). Sales of 16mm. cameras, by far the most popular size, should climb from \$700,000 in 1972 to \$1 million in 1976. Rotary types account for more than 90% of 16mm. camera sales. Sales of 35mm. planetary cameras, used primarily for microfilming large engineering drawings, are expected to remain stable through 1976 at \$250,000 per year. Limited demand is foreseen for step-and-repeat cameras until their prices are significantly reduced.

Readers.—Reader sales are expected to experience the highest growth rate of any single item within the product category. French purchases of readers in 1972 totaled \$750,000. Growing at an estimated 31% a year, reader sales could reach \$2.2 million in 1976. The strong surge in demand forecast for readers is based on an anticipated rapid increase in the number of COM systems installations and on a trend toward micropublishing.

Reader/printers.—French preference for hard copy has boosted sales of reader/printers to second place, after COM devices, in 1972 sales of all micrographics equipment. According to French trade sources, sales of reader/printers are expected to advance 75% over the period 1972-76, going from \$1.2 million to \$2.1 million. French customers are rapidly switching to electrostatic reader/printers.

Duplicators.—The rapidly growing adoption of active micrographics systems in the French market, particularly in the commercial and industrial sectors, is expected to stimulate demand for duplicators. Sales of this product are forecast to rise from \$800,000 in 1972

to about \$1.2 million in 1976, a growth rate of over 10% a year.

Processors.—Sales of processors, which represent a small share of the French micrographics market, are expected to increase about 10% a year through 1976. From a 1972 level of \$200,000, processor sales should increase to \$300,000 in 1976.

Computer-output-microfilm (COM) devices.—COM sales, valued at \$1.5 million in 1972, are expected to rise 40% to about \$2.1 million in 1976. France's total COM population, placed at 20 in 1972, should reach at least 60 by 1976. There are over 5,000 computers in France; almost a third are medium-to-large size machines. The country's substantial computer population, coupled with strong emphasis on full utilization of equipment, indicates an excellent growth market for U.S. exports of COM equipment in France.

Automatic retrieval devices.—Micrographics equipment uses are still in a relatively early stage in France. Therefore, the advantages of automatic retrieval devices for rapid and timely data dissemination are not yet fully understood. This, combined with high initial cost, inhibits realization of the potential market for automatic retrieval devices. However, local trade sources indicate that use of automatic retrieval devices will accelerate once prices are lowered and users are better informed on cost effectiveness.

Supplies.—Purchases of supplies totaled \$4 million in 1972, representing 42% of the French micrographics market. Demand for supplies is expected to increase at an average rate of 15% per year and reach \$7 million in 1976. Exceptional sales growth is forecast for diazo film, based largely on the predicted rapid increase in the COM market, while demand for silver halide film should increase by about 10% annually.

Services.—The combined market for COM and conventional microfilm conversion services is forecast to increase from \$1 million in 1972 to \$1.5 million in 1976. A dramatic expansion is expected for micropublishing services during the next 4 years. Based on an estimated average annual growth rate of 90% micropublishing revenues are expected to surge to \$4 million in 1976, up from a modest 1972 base of \$300,000.

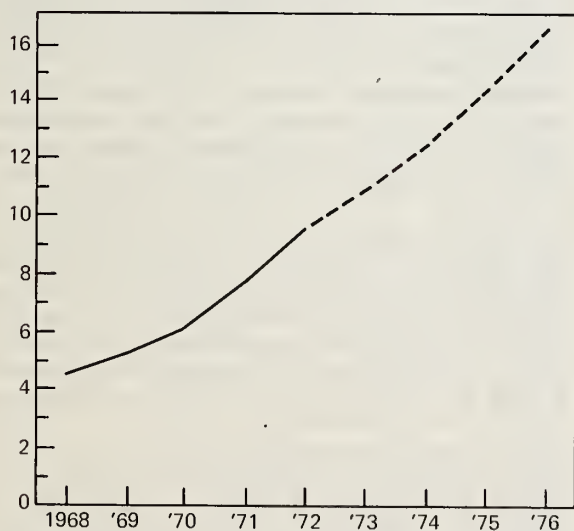
Rising Demand Foreseen

Commercial enterprises represent the principal market in France for micrographics equipment and supplies, commanding about 40% of the total (see table 4). Private industry, the second largest end-user group, consumes about 35% of all micrographic products purchased in France. The public sector, another prime user, accounts for 15% of the market. Other lucrative sales prospects are service centers, micropublishing firms, medical facilities, libraries, and public utilities, which together buy 10% of the micrographics products sold. Seventy-five percent of the micrographics market is concentrated in Paris.

Commercial.—The commercial sector accounted for 4% of the French gross national product (GNP), or \$7.8 billion, in 1972. This paper-oriented sector of the economy purchased an estimated \$3.8 million of microfilm equipment and supplies in 1972.

The high degree of concentration in the French bank-

Figure 1. - France: Size of market for micrographics equipment and supplies, 1968-72, and projected 1976
(in millions of U. S. dollars)



Note: Size of market equals production plus imports minus exports.

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on French trade estimates and BIC analyses.

Table 1.—France: Size of market for micrographics equipment and supplies, 1968-72, and projected 1976
(in millions of U.S. dollars)

	1968	1969	1970	1971	1972	1976
Production	3.6	4.1	5.0	5.7	6.7	11.7
Imports	2.8	3.2	3.6	4.8	6.2	10.5
Exports	1.8	2.1	2.5	2.8	3.4	5.7
Size of market	4.6	5.2	6.1	7.7	9.5	16.5

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on French trade estimates and BIC analyses.

Note: Size of market equals production plus imports minus exports.

ing industry has facilitated the adoption of modern data processing equipment. Outlays for micrographics products to date have been greater in banking than in any other user group. The micrographics facilities of French banks are used extensively for both archival and active applications.

While there are some 300 individual banks in France, three large government-owned commercial banks predominate. They are Credit Lyonnais, Société Générale, and Banque Nationale de Paris, all headquartered in Paris. Each of these three banks has about 2,000 branches throughout the country and employs over 15,000 workers.

Credit Lyonnais has been using two DatagraphiX 4600 COM's since 1965 to disseminate centrally processed information to its branches. It recently acquired two additional COM recorders, one 3M EBR, and one Memorex. Some 6,000 SEACO microfiche readers are used in its branch offices.

Société Générale, France's third largest bank, employs two 3M COM units to provide microfilmed record copies of all clients' account balances for distribution to its 1,900 branch offices.

Banque Nationale de Paris, France's largest bank, has not yet introduced micrographics equipment in its data handling operations but is likely soon to become a very significant user.

Compagnie Bancaire's microfilm system is based on a 3M EBR COM recorder. Other large banking institutions, such as Credit Populaire, Credit Agricole, and Caisse Nationale d'Epargne, also are potentially good sales prospects.

The insurance industry, like banking, is made up of several hundred centralized firms, many of which are represented throughout the country by branches. Micrographics equipment is not yet employed significantly in insurance, but mounting documentation problems and operating costs are expected to prompt many firms to modernize. There is potential for large- as well as small-scale systems.

Prime potential customers include Groupes des Assurances Générales de France, Ganles Assurances Nationales, and L'Union des Assurances de Paris—all headquartered in Paris. Trade sources indicate that 16mm. storage and retrieval systems and COM recorders to handle accounting operations are of particular interest.

Industry.—The industrial sector in France, which accounts for 45% of the GNP, has been growing at 6 to 8% annually in real terms. The 1966 official census of registered enterprises reported 1,909,486 French firms; 38.2% were classified as manufacturing concerns.

Industrial companies in 1972 accounted for 35% of the French micrographics market, or \$3.3 million. Over half of this dollar volume was spent for 35mm. systems used to microfilm engineering drawings. From a functional standpoint, archival storage applications and active applications in the industrial sector now account for 85% and 15% of the market, respectively.

Compagnie Francaise des Petroles (CEP), Paris, with annual sales of \$2.4 billion and 23,000 employees, uses a service bureau for engineering drawing reproduction. CFP plans to establish an in-house, 16mm. micrographics system to be used mainly for general accounting applications. The initial system will include one 16mm. camera and 15 readers, among other equipment.

A large construction company, Saint-Gobain Pont A Mousson (SOCEA), employs one 16mm. camera, one 35mm. camera, 40 readers, two reader/printers, one processor, and one duplicator for engineering drawing and business applications.

Citroen, a Paris-based automobile manufacturer employing 96,000 people, has an in-house installation consisting of one Memorex COM recorder, five readers, one processor, and one duplicator. Citroen's micrographics applications include personnel administration and work-in-process control and will extend to general accounting in the near future.

Air France, with 27,500 employees, uses a service center primarily for microfilming engineering documentation. It plans to install its own in-house micrographics system and should emerge as a large buyer of micrographics products.

Another important end-user is Thompson C.S.F., Paris, leading French electronics firm with annual sales of about \$300 million and 22,500 employees. It uses a 35mm. micrographics system for engineering drawing applications. The system includes one 35mm. camera, 2 readers, one processor, and one duplicator.

Government.—The French Government's Sixth Economic Plan, begun in 1971, emphasizes the modernization of all government administration, both in the capital and in the provinces. This policy is expected to lead to increased use of micrographics equipment.

French government agencies in 1972 accounted for about 15% of the micrographics market, or \$1.4 million. The largest government customer is the Administration des Postes et Telecommunications (P&T), controlled by the Ministry of Finance. This agency operates the mail, telecommunications, postal money order, and postal checking account systems. Eight out of 20 P&T regional offices and 100 large post offices are equipped with microfilming equipment. Ten more re-

Table 2.—France: Value and market share of imports of micrographics equipment and supplies by country of origin, 1968-71
(in thousands of U.S. dollars)

	1968		1969		1970		1971	
	Value	Market share percent	Value	Market share percent	Value	Market share percent	Value	Market share percent
United States	1,400	50	1,700	53	2,200	62	2,700	56
Germany	850	30	1,120	35	1,100	30	1,600	34
Other	540	20	370	12	270	8	470	10
Total	2,790	100	3,190	100	3,570	100	4,770	100

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on French trade estimates.

gional offices were recently equipped with a total of 30 cameras, 50 readers, 10 reader/printers, and 10 processors. The P&T also contemplates buying COM's and/or cameras to microfilm customer account statements.

Another Ministry of Finance entity which relies on micrographics techniques to bring its vast volume of paperwork under control is the National Institute of Statistics and Economic Studies (INSEE). The Institute uses a Memorex COM recorder, one camera, a processor, a duplicator, and 30 reader/printers to microfilm census data and economic information for dissemination to regional offices.

Administration des Archives Nationales in Paris uses four cameras, one processor, and 20 readers for public viewing of documents. The Bibliotheque Nationale, also in Paris, microfilms originals of professional and scientific papers and sends copies to researchers and academic institutions abroad. Centre de Documentation de L'Armement, Paris, performs a similar service for the French defense industry. Centre National de la Recherche Scientifique (CNRS), Paris, has 80 full-time employees in its microreproduction department to disseminate scientific and technical information to university and corporate researchers. CNRS utilizes 10 step-and-repeat cameras, five reader/printers, and two duplicators. CNRS is jointly developing a computer-based automatic retrieval system with Electricite de France, the nationalized electric utility company.

The Police Judiciare in Paris has begun microfilming all criminal investigation files, using two 16mm. cameras, one automatic processor, a duplicator, four readers, and a reader/printer.

At the local government level, the Rennes Municipal Archives has installed a complete micrographics system to microfilm all municipal records formerly stored in heavy bound volumes. The system comprises one Recordak Micro-File MRD-2 machine, one portable RP microfilmer, a Recordak Prostar film processor, one Recordak reader/printer, and a Recordak Magnaprint reader.

Service centers.—France has 15 conventional microfilm service centers and nine COM service bureaus. Tirages Industriels is one of the largest of the conventional centers. Specializing in 16mm. and 35mm. applications, it employs nine persons for its micrographics operations. Its equipment includes four 35mm. planetary cameras, two 16mm. rotary cameras, one Schlumberger

step-and-repeat camera, three reader/printers, one reader/filler, and one processor.

Three COM service centers are equipped with Kodak's KOM 90: Centre Informatique de Gestion Appliquee, Cambrai; Kodak Pathe SA, Paris; and Meti, Nantes. Singer Information Service Company, Paris, and Société d'Exploitation des Donnees, Talence, have installed DatagraphiX recorders. Gestion Service and Ordinateur Express, both in Paris, acquired 3M EBR COM's. Institut International d'Informatique, Echirolles, is equipped with a Memorex 1603, and the Centre de Traitement des Donnees, Paris, has installed BETA-COM recognition equipment. It is anticipated that some corporate COM users will enter the service bureau market commercially in order to sell spare time available on their COM installations to outside customers.

Micropublishing.—Librarie Hachette (LH), a major publishing house in Paris, is France's most important micropublisher. Its micropublishing revenues, estimated at \$150,000 in 1972, are expected to surge to \$2.5 million in 1975. LH, which began microfilming old French texts in 1971, now publishes in microform 900 books a year. It offers microfilmed copies to students and universities around the world and expects the United States to be its major market.

LH is also developing microfilm-based educational packages geared to professional training. This activity also is forecast to experience rapid growth in the years immediately ahead, predicted on recently enacted legislation making it mandatory for French firms to spend a certain minimum percentage of their annual sales on personnel training.

Another French organization active in micropublishing is Association pour la Conservation et la Reproduction Photographique de la Presse (ACRPP), Paris. ACRPP, in cooperation with Bibliotheque Nationale, microfilms a large number of French newspapers. Its microfilmed publications are marketed to educational institutions and students all over the world, including the United States.

Other potential markets.—There has been a growing, though still limited, demand for micrographics products by such user groups as public utilities, medical facilities, and libraries. Although lagging behind counterparts in other Western countries in the use of micrographics equipment, these customer groups are expected soon to comprise significant markets for the product category. The development of these markets has been inhibited by the reluctance of French administrators

Table 3.—France: Sales of product category by principal subcategories, 1972, and projected 1976

(in thousands of U.S. dollars)

Micrographics equipment	1972	1976
Computer-output-microfilm (COM) devices	1,500	2,100
Reader/printers	1,200	2,100
Cameras	950	1,350
Readers	750	2,200
Duplicators	800	1,200
Processors	200	300
Other equipment	100	250
Total	5,500	9,500
Micrographics supplies	4,000	7,000
Grand total	9,500	16,500

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on French trade estimates.

in these groups to change from traditional information handling procedures. A personalized direct selling approach is needed to convert administrators in these segments of the market into micrographics equipment purchases.

Legal Aspects of Microfilm

Legislation has yet to be enacted in France removing restrictions on the admissibility of microfilm documents as evidence in French courts. French law, at present, permits the courts to accept records on microfilm only as a "start of written proof." However, the Comité Français de Reprographie has submitted to the Ministry of Justice a liberalized draft code governing the legal aspects of microfilm documents. If the proposed code is enacted into law, microfilm documents would be regarded by French courts as legal evidence under certain specified conditions. This could result in increased new sales for U.S. exporters.

Knowledgeable local trade sources point out, however, that the growth of the French micrographics market is not seriously hampered by present microfilm legislation. Their contention is supported by the fact that many large companies have taken the risk of destroying original documents, once they are recorded on microfilm, rather than pay the high storage costs of traditional filing.

Competitive Environment

France is the fifth largest market for U.S. exports and the fourth largest importer in the world. U.S. micrographics equipment and systems find strong acceptance among French buyers on the basis of superior technology and design. The high reputation of U.S. micrographics products enhances their sales in the French market and counterbalances lower prices offered by competition. Furthermore, micrographics hardware manufactured in the United States and not yet available from European sources is also highly attractive in the French market.

The United States is France's principal supplier of micrographics products, accounting for more than half of the annual imports during 1968-71. In the same period, purchases of U.S.-made micrographics products

nearly doubled from \$1.4 million to \$2.7 million (see table 4). Kodak Pathe S.A. and 3M France, both U.S. subsidiaries, manufacture micrographics supplies in France. Other U.S. micrographics firms active in the expanding French market are Bell & Howell, NCR, DatagraphiX, Memorex, Rank Xerox, and Remington Rand.

The major "foreign" competition in the French micrographics import market comes from German manufacturers, who account for about a third of the total. Agfa Gavaert and Microbox both rank as important competitors in the French market.

French production of micrographics hardware and supplies in 1971 totaled \$5.7 million, of which \$2.8 million was exported. Domestic manufacturers and their respective products are: Benson S.A., Creteil (COM recorders); Microfilmex, Paris (35mm., 75mm., and 125mm. cameras, and enlargers); Regma-La Cellophane, Paris (reader/printers); Muray, Paris (roll film and microfiche readers); Le Matériel Compact, Paris (microfiche readers); Compteurs Schlumberger, Montreuil (step-and-repeat cameras); Sadia, Levallois (duplicators, printers, and reader/printers); Ectim, La Celle, Saint Cloud (16mm. planetary cameras); Jem's Saint Maurs des Fossés (16mm. planetary cameras); Noxa, Montreuil (microfiche readers); and Sintra, Asnières (roll film and microfiche reader/printers).

As a member of the European Economic Community (EEC), France grants duty-free entry on imports from other member countries. France's tariffs on imports from non-EEC countries are established under the EEC's Common External Tariff (CXT). CXT duty rates levied on micrographics products, based on the cost, insurance, and freight (c.i.f.), are as follows:

All micrographics equipment (except readers, reader/printers, and COM recorders), 13%; readers and reader/printers, 10.5%; sensitized film in reels or strips, nonperforated, 12.8%; automatic information processing equipment and peripherals (COM recorders included) 7%.

Information about duty rates on specific micrographics products may be obtained from the Domestic and International Business Administration, U.S. Department of Commerce, Washington, D.C. 20230.

France imposes a sales tax, called a "value added tax" (TVA), on most manufactured goods, whether domestically produced or imported; currently, the TVA on micrographics equipment is 33⅓% on equipment and 23% on supplies. On imported goods, TVA is levied at the time of importation on the landed price

Table 4.—France: Value and market share of micrographics consumption by principal user sectors, 1972

(in millions of U.S. dollars)

Sector	1972	Percent
Commercial	3.8	40
Industrial	3.3	35
Government	1.4	15
Others	1.0	10
Total	9.5	100

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on French trade estimates.

(c.i.f. value plus duty). Users of micrographics equipment in France may deduct from the TVA due on their sales, the amount of TVA paid on their purchases of investment goods, including micrographics equipment.

Sales Development

The sales and service subsidiary is the tested route to successful micrographics products sales in France. Although some smaller equipment items and supplies can be marketed by local distributors who stock spares and provide services, the optimum arrangement is a well-staffed local technical service center. While it is true the French micrographics market has different characteristics and presents different problems, essentially the same channels used to reach the U.S. customer can be employed in France.

Recommended methods of promoting the sale of micrographics products in France include display advertising, both in daily newspapers and specialized publications; direct mail advertising; participation in micrographics-oriented lectures, conferences, seminars, and exhibitions; ad hoc demonstrations and presentations; and general public relations activities.

Newspapers and trade publications are considered good vehicles for regular display and prestige advertising of micrographics products. Some French publications with a wide readership among those making purchase decisions are *Enterprise* (weekly); *L'Expansion* (monthly); *Le Management* (monthly); *Bureau et Informatique* (monthly); and *Informatique et Gestion* (monthly). All these trade journals are published in Paris.

French trade associations concerned with micrographics are useful contacts for U.S. suppliers. Penetration of the market can be facilitated by contacting Comité Français de Reprographie, 14 Rue Lord Byron, Paris 8, and Centre d'Information du Matériel et des Articles de Bureau (CIMAB)) 4 Rue de Castellane, Paris 8. These associations are generally well-informed as to industry's immediate and planned requirements and can assist in locating and establishing sales representation or other affiliations with French firms; they also can provide helpful advisory service.

The SICOB show (Salon de l'Informatique, de la

Communication et de l'Organisation de Bureau) is the largest French commercial exhibition in the field of data processing, communications, and office equipment; it is held each fall in Paris. This exhibition is the most important office equipment event in continental Europe in terms of participating firms and visitors. The last exhibition, which attracted 325,000 visitors, featured the products of 550 exhibitors from 20 countries.

The 1973 show is planned for September 26 through October 5; it is sponsored by SICOB, 6 Place de Valois, Paris. Early application for space is necessary, as participation is reserved for prior exhibitors, and only a few firms relinquish their space each year.

Technical Standards

Throughout France, electric power is 220 volts, single-phase, 50 cycles. In some areas, 380 volts 3-phase, 50 cycles is available. All equipment plugs must have an earth connection, as required by the nationalized electric utility company, Electricité de France.

The metric system of weights and measures is the statutory standard in France.

Demand in France is strongest for 16mm. and 35mm. microfilm sizes; use of 75mm. and 105mm. is still limited.

The U.S. standardized microfiche frame size and formats have been adopted by the French. The standard 105mm x 148mm. microfiche contains 60 and 96 document-page images.

The most common reduction ratio for microfilming letter-size and legal-size documents is 24:1. For engineering documentation, the reduction ratio most commonly used is 30:1 for large drawings and 15:1 for smaller drawings.

A loan copy of basic research report "Micrographics—France," DIB 73-03-502, upon which this Export Market Digest is based, may be obtained from the Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

Germany

Germany is one of the most lucrative and fastest growing markets for U.S. micrographics equipment and supplies. Market analysts estimate that only about 4% of the potential for micrographics in Germany has been developed, and rapid growth, now underway, is forecast to continue in the years ahead. Despite a relatively large domestic market, there are only a few important German micrographics manufacturers, and these supply only about 30% of the Nation's needs. American micrographics manufacturers are expected to maintain their lead over all micrographics competitors in the German marketplace in the decade ahead.

Highlights

► Germany, one of the world's largest markets for micrographics equipment and supplies, will triple its demand to over \$80 million annually by 1976.

► Most of Germany's micrographics needs are filled by imports, which are expected to rise from \$21 million in 1972 to \$54 million in 1976. American exporters supply more than half of these imports.

► German banks and major industrial corporations are the most promising growth areas for microfilm equipment, followed by the Government, insurance companies, research institutes and hospitals.

► Computer - Output - Microfilm (COM) installations are expected to increase rapidly — from 25 in 1972 to well over 200 by 1976, and COM sales should exceed \$6 million in 1976.

An Annual Growth Rate of 30% Is Expected

The micrographics market in Germany charted substantial growth in the period 1968 to 1971, rising from \$9.3 million to \$22.5 million, and is expected to continue this growth to reach \$83.7 million by 1976. (See table 1.)

Germany imports nearly 75% of its micrographics requirements, with totals rising from \$6.9 million in 1968 to \$16 million in 1971. (See table 2.) American micrographics manufacturers exported \$5.2 million of equipment and supplies to Germany in 1969 and \$8 million worth in 1971, accounting for half of all German imports of these products. The other half of this import market is supplied by Belgian, Dutch, English, French, and Japanese manufacturers, although some of these products come from plants owned by U.S. subsidiaries.

Sales Potential Is Excellent

Sales of micrographics equipment and supplies are expected to rise rapidly in Germany during the 1972-76 period and may total over \$200 million during those years. An extensive market survey recently conducted for the U.S. Department of Commerce shows that the following products should have especially good sales potential for U.S. manufacturers over the next several years:

- Microfiche readers
- COM systems, on-line and off-line
- Inexpensive 16mm. reader/printers
- 35mm. planetary processor cameras
- Inexpensive 16mm. flow cameras
- Microfilm processors
- Enlarger/printers and automatic printers
- Microfilm jackets and jacket mounters

Microfilm inspection and editing equipment.
Diaz and vesicular film

Readers.—Sales of microfilm readers are forecast to grow by over 40% a year, reaching a level of \$14.6 million in 1976. (See table 3.) German firms are expected to greatly increase their use of microfilm for the transmission and dissemination of data, which will spur the purchase of large numbers of readers. Highest growth potential may be for microfiche readers. The growth of micropublishing in Germany also is expected to increase the demand for readers. The market for 35mm. readers with oversized screens also is sizable, although purchases of these readers usually are made as a part of a package from one of a limited number of established 35mm. suppliers.

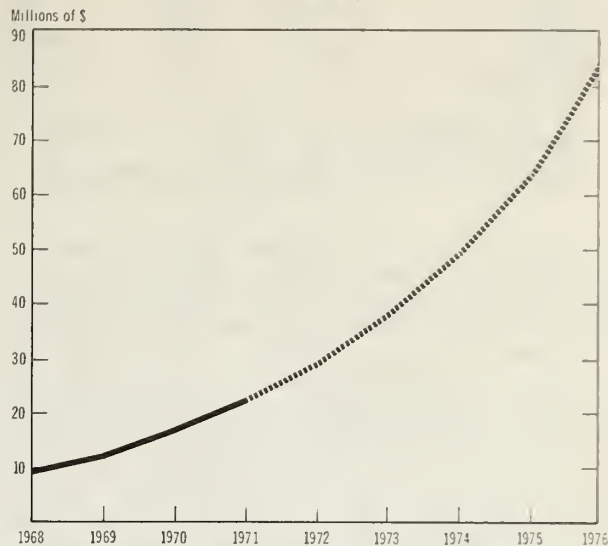
Computer - Output - Microfilm (COM) Devices. — Banks, COM service centers, and research institutions at present are the major users of COM equipment in Germany. Between 1969 and mid-1972, 27 COM's were sold, rented, or ordered in Germany, and it is expected that 200 COM installations will be installed by 1976. COM sales should increase from \$1.2 million in 1971 to \$6 million in 1976, a growth rate of almost 40% a year.

All COM's are now imported from the United States, and the only threat to U.S. exports eventually may come from Japanese manufacturers. About 80% of COM's are leased or rented. Rentals vary from about \$1,100 to \$1,600 monthly for on-line equipment and to \$5,100 monthly for off-line equipment, although special discounts are sometimes given. The trend is toward off-line COM systems, but the market for lower cost systems attached to medium-size computers will remain sizable (30% to 40% of total COM sales).

Reader/printers.—Because many types of "active" microfilm systems used to disseminate data will require only readers and not reader/printers, reader sales will surpass reader/printer sales in the years ahead. The market for reader/printers, however, should grow by almost 30% yearly, from \$1.5 million in 1971 to \$5.4 million in 1976. Inexpensive or moderately priced reader/printers should have excellent sales potential. Enlarger/printers, used to reproduce microfilm on aperture cards, also should have good sales potential and a good demand is foreseen for automatic printers.

Cameras.—Camera sales totaled \$7 million in 1971 and are expected to grow at a rate of 18% per year, reaching \$16.1 million by 1976. Sales of 35mm. planetary cameras, totaling \$2 million in 1971, are expected to increase by 16% a year for the next few years, with sales of processor cameras growing most rapidly. The 3M Company and Microbox have the largest share of the 35mm. camera market. Sales of 16mm. cameras, totaling \$5 million in 1971, are expected to increase by 19% a year. Most 16mm. cameras sold are inexpensive flow cameras, 90% of which are imported. Banks are the largest users of these cameras, supplied mainly by Kodak and Agfa. Step-and-repeat cameras still have a negligible share of the camera market in Germany. Much of the information stored on microfiche is now produced on 105mm. film by means of COM equipment, and the film is then cut into fiche. Sometimes, however, 16mm. film is collated to create fiches. With total

Figure 1. - Germany: Micrographics equipment and supplies market, 1968-71; and projected 1972-76
(in millions of U.S. dollars)



Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on German trade estimates and BIC analyses.

sales of \$16.1 million in 1976, cameras will remain an important sector of the micrographics equipment market.

Duplicators.—From a 1971 sales level of \$500,000, the market for duplicators is expected to grow by about 30% per year to \$1.7 million in 1976, mainly because of increasing demand for multiple copies of microfilm for certain types of information systems. Universal roll duplicators and microfiche duplicators will account for most duplicator sales, which are made primarily by the German firm, Kalle. Sales of microfilm processors, totaling \$1.5 million in 1971, should expand to \$2.8 million in 1976. The trend toward the use of processor cameras and the sale of film with processing costs included should preclude more rapid growth in processor sales.

Miscellaneous Equipment.—Sales of other types of micrographics equipment are expected to grow rapidly. Jacket mounters, with an estimated market of approximately \$200,000 in 1971, are expected to increase rapidly—by more than 50% per year—for the next 5 years. Therefore, the market for these in 1976 should total about \$1.5 million. N.B. jackets, sold by Kodak and Bell & Howell, dominate this market at present. Inspection and editing equipment sales will grow by about 30% a year from a base of about \$200,000 in 1971. Aperture card mounter sales are expected to increase at about 18% a year. The market for automatic retrieval devices is limited at present but may grow more significantly once German companies build up large inventories of exposed microfilm.

Supplies.—Sales of micrographics supplies, totaling \$8 million in 1971, are expected to expand by about

Table 1.—Germany: Size of market for micrographics products, 1968-71, and projected 1972 and 1976¹
(in millions of U.S. dollars)²

	1968	1969	1970	1971	1972	1976
Production	3.9	5.5	8.3	10.8	14.5	48.3
Imports	6.9	8.9	12.0	16.0	20.6	53.8
Exports	1.5	2.1	3.2	4.3	5.6	18.4
Size of Market	9.3	12.3	17.1	22.5	29.5	83.7

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on German trade estimates and BIC analyses.

¹ Size of market equals production plus imports minus exports.

² Conversion rate: One U.S. dollar may vary between DM 3.2950 and DM 3.1500.

34% a year for the next 5 years. Microfilm sales, estimated at \$6 million in 1971, comprise 75% of all micrographics supplies sold in Germany. Microfilm sales are expected to grow by almost 40% a year, with duplicating films growing most rapidly. Diazo and vesicular film markets are believed to be relatively open to the entry of new suppliers, while silver halide film is supplied mainly by three large firms—one German, one American, and one Japanese. The market for reproduction paper, supplied mainly by an American firm, is expected to grow by about 30% a year in conjunction with increased sales of reader/printers and printers. Micrographics chemicals are expected to grow at a slightly slower rate than the film market, due to increased sales of duplicating film using little or no chemicals. The market for jackets will show very substantial growth of about 50%, going from its present level of \$300,000 to \$2 million annually by 1976. Aperture cards used with 35mm. systems probably will experience moderate sales growth in the future.

Services.—There are 45 conventional and six COM service centers in Germany, with sales totaling \$7 million in 1971. Based on a predicted average annual growth rate of 16%, the market for conventional services is expected to expand from \$5 million in 1971 to \$10.5 million in 1976, with 60% of this total being for 35mm. microfilm services. The future annual growth rate for COM services is estimated at 80%, from the 1971 base of \$250,000, but it is believed that competition will be strong, and the field is overcrowded. Micrographics service centers also sold an estimated \$1.7 million worth of equipment in 1971.

Micropublishing, still in its infancy in Germany (the 1971 market was estimated at only \$50,000), is expected to experience unprecedented growth to \$1 million annually in 1976. The *Frankfurter Allgemeine*, a German newspaper, is being sold in microfiche form and the Springer Verlag, a publisher in Heidelberg, is selling technical magazines and reports in microform. Other German publishers are test-marketing or considering micropublishing.

Micrographics Sales Booming

Microfilm was introduced to the German market in the late 1950's, and banks became large purchasers of this equipment after 1965, when a law was passed recognizing microfilm as a legal method for storing certain types of financial information. Banks now account for 65% of all 16mm. micrographics sales in Germany, followed by government offices (13%), in-

dustrial firms (12%), and other organizations such as research institutes, hospitals, libraries, and service centers. German manufacturing firms, on the other hand, account for 67% of all 35mm. micrographics sales, followed by the Government (23%), and other types of organizations (10%). Insurance companies have good sales potential for the future, and several large German insurance companies now are considering the purchase of COM systems. German banks, manufacturing firms, and mail order houses also use COM equipment, sales of which should total over \$17 million during the growth years from 1972 through 1976. With many types of German firms and organizations planning to invest in micrographics, sales of all types of equipment are expected to total \$167 million and sales of film and supplies are expected to total \$105 million from 1972 through 1976.

Commercial.—German financial institutions are the largest users of micrographics, accounting for about 50% of all sales of equipment and supplies and for 67% of the 16mm. market. In 1970, there were 3,605 banks in Germany, with aggregate deposits of \$260 billion. The 13 large public banks have deposits of over \$40 billion, the 314 credit banks have deposits of over \$65 billion, and 3,288 savings and other banks have deposits of \$155 billion.

The market for microfilm for "archival" or storage purposes in financial institutions is now almost saturated. The 1971 amendment of a 1965 law establishing simplified rules for storing information is expected to convince the few remaining banks to adopt microfilm for "archival" or storage purposes. A further amendment of the 1965 law, expected in 1974, would permit the storage of official financial statements and inventory records on microfilm, not just original invoices and commercial correspondence, a development which would further spur the sale of microfilm and supplies.

The major boost to micrographics sales is coming from the development of microfilm "systems" which require jackets and microfiche to store customer information. The largest bank in Germany, the Westdeutsche Landesbank Girozentrale (WLG), is an advanced user of these systems. With corporate offices in Dusseldorf and Munster, this institution employs 6,000 people. The bank rents one Stromberg-DatagraphiX 4440 COM recorder, which is used in Dusseldorf to microfilm yearly accounts statements for storage on 16mm. film. By use of microfiche it also records monthly customer accounts for internal active use and monthly statements of payments made by customers. The WLG has ordered

Table 2—Germany: Direct imports of micrographics by countries of origin, 1969-71
(in millions of U.S. dollars) ¹

	1969		1970		1971	
	Value	Market share percent	Value	Market share percent	Value	Market share percent
United States	5.2	58	6.1	51	8.0	50
Belgium/Netherlands	1.3	14	1.8	15	2.6	16
United Kingdom .....	.9	10	1.8	15	2.4	15
France .....	.6	7	.8	7	1.2	8
Japan .....	.2	2	.4	3	.8	5
Others .....	.7	9	1.1	9	1.0	6
Total	8.9	100	12.0	100	16.0	100

Source: U.S. Department of Commerce, Bureau of International Commerce market survey study. These estimates are based on available statistics for one product group (readers, reader/printers) and on estimates from manufacturers and micrographics experts.

¹ Conversion rate: One U.S. dollar may vary between DM 3.2950 and DM 3.1500.

two more Stromberg-DatagraphiX 4440's (rented) for a subsidiary which acts as a clearinghouse for most savings banks in the region.

A savings subsidiary of the WLG also has developed an innovative project. Each of its 600,000 customers will be allotted four jackets containing different kinds of information; and all files will be microfilmed, for a total of 2.4 million jackets. For the Munster branch alone, specially designed readers already were on order at a cost of \$380 each. WLG's micrographics plans are more ambitious than most, and this bank is expected to set the pace for other large German banks for the next several years.

One of the major private banks in Germany, the Dresdner Bank, with \$6.5 billion in deposits and 23,000 employees, is testing COM's and is expected to buy one in the near future. It also intends to introduce active microfilm usage shortly, but not on the same scale as the WLG.

The Bausparkasse Wustenrot, Ludwigsburg, a leading savings bank with seven branches and 2 million customers, is using microfilm cartridges only for storage of files but has been evaluating the active use of jacket systems, which would require a significant amount of equipment, chiefly readers.

The Commerz Bank AG, Frankfurt, a large private bank, began to use microfilm for storage purposes in 1965, several years after the other large banks. It has been investigating the use of COM systems and may decide to use one soon. Only 50 readers are available at present for 750 branches, and the introduction of COM equipment would create the need for many more readers.

There are at least 100 public banks in Germany with sufficient money and customers to justify an in-house COM, while approximately 250 banks could justify the use of other types of active microfilm systems for customer files. The Bundesverband deutscher Banken e.V., Mohren-strasse 35/41, 5 Kolm 1, and the Deutscher Sparkassen und Giroverband e.V., Buschstrasse 32, 53 Bonn, are the organizations of German banks which best give detailed information about their member banks.

German insurance companies presently use considerably less microfilm equipment than the banks, but

they will be good sales prospects for microfilm systems in the future. The larger insurance companies, such as the Allianz Versicherung AG in Munich and the Allianz Lebensversicherung AG, in Stuttgart, are preparing to use microfilm for storage of customer files. The Allianz Versicherung also is evaluating the feasibility of using COM systems. COM's, microfilm systems utilizing jackets, and other microfiche systems should have high sales potential in this market.

Industrial—Industrial firms purchase about 67% of the 35mm. microfilm equipment sold in Germany and account for 25% of the entire micrographics market. Manufacturers of machinery, vehicles and equipment are the most important users of 35mm. equipment, although architectural bureaus also use some 35mm. microfilm. These corporations, however, use only about 12% of the 16mm. microfilm equipment sold in Germany, compared to the 67% purchased and used by banks.

About one-fourth of Germany's large manufacturing firms use microfilm; of those having more than 1,000 employees, 35% use it. The investment necessary to equip a microfilm lab is high, and this encourages small and medium-size firms to rely on service bureaus to fill their micrographics requirements.

Most users of 35mm. film have been converting from roll film to aperture cards. Duplication of aperture cards for these firms is often performed by service bureaus, which have very expensive, high production equipment for this purpose. A medium-size firm in heavy manufacturing typically has one or two large planetary cameras and one processor (or one processor camera), five to 50 readers with different size screens, and one large (sometimes automatic) printer. About half of these firms own a card mounter and a duplicator. The number of readers in each firm is determined by how actively microfilm is used and by the number of decentralized technical bureaus, with some firms having as many as one reader for every four engineers.

Manufacturing corporations usually introduce 16mm. microfilm systems after having used and gained experience with 35mm. equipment. Many major corporations still are not using 16mm. microfilm systems, but some presently are considering using this equipment for customer files, accounting documents, personnel files, and

Table 3.—Germany: Sales of micrographics products 1971 and projected 1976
(in millions of U.S. dollars)¹

	1971	1976
<i>Micrographics equipment</i>		
Cameras	7.0	16.1
Readers	2.3	14.6
Reader/printers	1.5	5.4
Processors	1.5	2.8
Computer-Output-Microfilm (COM) devices	1.2	6.0
Duplicators .....	.5	1.8
Other equipment .....	.5	3.0
Total	14.5	49.7
<i>Micrographics supplies</i>	8.0	34.0
Grand Total	22.5	83.7

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on German trade estimates and BIC analyses.

¹ Conversion rate: One U.S. dollar may vary between DM 3,2950 and DM 3,1500.

technical documents, especially of parts catalogs. For the first three applications, jackets seem to be considered the preferred means of storing information, while microfiche is being considered for catalogs.

The Volkswagenwerke (VW) AG is an example of a large German manufacturer which microfilms engineering drawings and uses them on aperture cards. VW now has several microfilm laboratories in its plants and is considering a project to introduce an active 35mm. microfilm system in its Kassel plant, which would generate the need for 400 readers of various sizes. The main plant in Wolfsburg would require twice again as many pieces of equipment, while all other VW plants would need half as much equipment as Kassel. VW presently has 15 to 20 16mm. cameras, five 35mm. processor cameras, five duplicators, 30 to 50 reader/printers, and 150 readers of various sizes. VW, in conjunction with Agfa, has developed a system whereby the VW spare parts catalog is filmed on microfiches, using a Calcomp COM. This catalog is being sent to all VW outlets and has created a need for a few thousand readers, to be purchased from Agfa.

Ford in Cologne also is introducing a microfiche spare parts catalog system. Other German auto manufacturers are now evaluating microfilm systems, but none has yet installed a fully developed system.

Another large user of microfilm is Messerschmitt Bolkow-Blohm AG, the largest aerospace firm in Germany, a builder of executive jets and military transport planes, with major plants in Munich and Hamburg. An active microfilm system was introduced recently. All drawings are now filmed on cards, while technical specifications are stored on jackets, and flight manuals and plane spare parts catalogs are put on cartridges. Messerschmitt expects to expand its 35mm. equipment inventory significantly in the next year or two. The Hamburg plant alone will require at least one large planetary processor camera, one aperture card camera, one duplicator, one jacket mounter, and two enlarger/printers. The cartridge system will require about 100 readers. Messerschmitt is expected to begin microfilming per-

sonnel files by the end of 1970 and is considering ordering a COM for its corporate offices in 1973. The other major aerospace firms in Germany, VSW Fokker, Bremen, and ERNO Bremen, are at about the same stage of development as far as microfilm applications are concerned.

There are three major and a few smaller mail order houses in Germany using microfilm. The three major firms, Quelle Versand in Furth, Neckermann Versand in Frankfurt, and Otto Versand in Hamburg, all have sales of more than \$300 million annually. Neckermann started to microfilm customer accounts and correspondence in 1971, mounting the film on jackets, two for each customer. It is estimated that 500,000 jackets had been used by the end of 1972. Neckermann also films customer information and other accounting documents on 16mm. rolls for storage purposes. A limited amount of film duplication also is done by this firm. Neckermann is expected to begin microfilming personnel files and eventually to order a COM recorder. All equipment in this firm and in most other mail order houses is bought from Kodak, which developed a microfilm "system" for mail order houses.

Many other types of German corporations are using microfilm. For example, BP, Benzin und Petroleum AG, Hamburg, a subsidiary of British Petroleum, has been filming accounting documents on 16mm. rolls and cartridges since 1965. It also has been keeping customer accounts on jackets (more than 100,000) since 1971. It also expects to put personnel documents on microfilm in the near future, generating some demand for additional equipment, but mainly for more supplies. Lufthansa, the German flag airline, has a microfilm lab based in Cologne where documents are filmed for filing purposes only; this lab has very limited equipment. Their microfilm laboratory for service handbooks, spare parts catalogs and flight manuals is in Hamburg. German corporations will continue to buy increasing amounts of micrographics.

Government.—The federal, state, and local governments in Germany are significant users of micrograph-

ics products, accounting for 15% of the total market. It is expected, however, that this market share will increase to reach at least 20% in the second half of this decade. Government offices now use 13% of the 16mm. equipment sold in German and 23% of the 35mm. equipment. Highest growth is expected in the use of 16mm. film and microfiche.

Until 1972 there was no significant coordination of microfilming among the various departments and agencies of the Federal Government. Since then, the Bundesrechnungshof (Federal Accounting Department) in Frankfurt has been assigned to evaluate all aspects of microfilming in the Federal Government. This department has been exploring the feasibility of introducing active microfilm (jackets) systems in most ministries. Positive recommendations are likely, which would spur a major boost in micrographic sales to the Government, although the full impact is not expected for at least 3 more years.

The largest user of microfilm in the German Federal Government is the Bundespost, which controls the post office, the telephone system, and a network of postal savings banks. The postal savings bank is considering purchasing a COM recorder. All 28 volumes of the German telephone directory are microfilmed in Köln/Braunfeld and distributed to all telephone information stations. The accounts of the more than one million customers of the postal savings bank are put on microfiche and distributed to 10 information centers, and all checks received also are microfilmed.

A number of other large government organizations use microfilm. The German Patent Office in Munich has patents microfilmed on aperture cards, and the proposed European Patent Office, to be located in Munich, also could become a customer for similar equipment. The Foreign Ministry uses microfilm to a limited extent, and the Ministry of Defense keeps all medical records of military personnel on microfilm. The Ministry of Interior stores the medical records of customs officers on jackets, and jackets also are used by the Ministry of Justice to store the files of all receivers of social security benefits. The Deutsche Bundesbahn (Federal Railway System) is keeping the railway tariffs on microfilm and is evaluating the use of COM's in conjunction with a service bureau.

At the local government level, a public organization, the Kommunale Gemeinschaftsstelle für Verwaltungsvereinfachung (Communal Institute for Administrative Efficiency), Postfach 510720, Cologne, has evaluated microfilm systems and has published a report on their use in city government. The major problems regarding the introduction of microfilm in municipal governments appear to be the psychological resistance of personnel assigned to use readers and the lack of trained personnel.

German cities make limited use of micrographics at present, the main users being real estate offices, city savings banks, loan and wage accounts of employees, and city archives. Demand for micrographics in city governments is expected to grow with the overall market but may not reach significant levels during the next 5 years.

Other.—Research institutions, whether sponsored by the European Economic Community (EEC) or the Fed-

eral German Government or whether attached to university departments, are moderate users of conventional microfilm systems. Most research institutes with large data processing departments, however, already have or are considering the purchase of COM recorders to store computer output. The European Space Operation Center (ESOC) in Darmstadt, for example, already has two COM's in use, together with a limited number of reader/printers and readers. ESOC is now considering using microfilm output, a move which would generate the need for 50 to 80 readers and reader/printers. ESOC also is considering cooperating with all other major European research institutions in the aerospace field, a development which could generate the need for as many as 2,000 additional readers. The Kernforschungsanlage Uelich, a governmental atomic research institution, is using a COM for graphic output and has its own microfilm lab. The Gesellschaft für Mathematik und Datenverarbeitung in Bonn and the Max Planck Institut in Munich and Heidelberg are other prominent research institutions which use microfilm equipment.

Most universities have microfilm equipment only in their libraries, where a few reader/printers are used. The data processing centers of several major universities, however, are considering the purchase of COM recorders. About 30 universities have more than 2,500 students, and 14 have major libraries with an average of 600,000 books each. There are nine institutes of technology in Germany, located in Aachen, Berlin, Braunschweig, Clausthal, Darmstadt, Hannover, Karlsruhe, Munich, and Stuttgart. All have more than 5,000 technical students except for Clausthal, which has 1,700.

Public libraries use microfilm equipment to a limited extent. The major public libraries are the Münchener Staatsbibliothek in Munich, the Westdeutsche Bibliothek in Marburg, the Deutsche Bibliothek in Frankfurt, and the Technische Informations-Bibliothek in Hanover, which is the largest documentation library in Germany and which receives all Ph.D. theses from the United States on microfilm (35mm.). The Hanover technical library has the largest inventory of microfilmed publications in Germany and uses two Rank Xerox Copyflo machines. The only other library with an automatic printer is the one in Kiel. The Staatsbibliothek in Berlin is said to have the largest collection of newspapers on microfilm in Germany. It is believed that libraries will be limited markets for additional microfilm equipment in the future.

Some hospitals are actively introducing microfilm systems in Germany. The Krankenanstalt Sarrbrücken has pioneered in the use of jackets for patient files. Several other hospitals have followed suit, and more are expected to install microfilm systems soon. A hospital would need one or two planetary cameras, one jacket mounter, one processor, one microfiche duplicator, and a number of readers and reader/printers, depending on the number of departments and readers. Hospitals would utilize sizable quantities of supplies, films, and jackets once they have begun to microfilm their records.

Service Centers

There are approximately 45 conventional service

centers in Germany, about 20 of which have some form of contractual agreement with manufacturers. Seven of them are selling the products of the German firm Microbox. The total revenues of the service centers have been growing at an average rate of 12% a year over the last 10 years, reaching \$7 million in 1971. About 60% of the microfilm services are for 35mm. systems.

There are six COM service centers. Three of these belong to the same group, LEX-COM Centers, which is planning to start at least five more service centers. COM service sales probably will grow very fast over the next few years, from a very low base of \$250,000 in 1971. This sector is now plagued by overcapacity, however, and COM service centers are fighting a price war to gain customers. Service centers are not expected to be a significant market for additional equipment sales in the near future. Some of the approximately 25 centers which do not yet have contractual agreements with manufacturers, however, could be used as sales outlets for micrographics products.

Legal Aspects of Microfilm

Microfilm documentation cannot be admitted as legal evidence in German courts at present. In 1965, a law was passed by the German parliament permitting microfilm to be used as a legal substitute, for tax purposes only, of original invoices, commercial correspondence, and accounting documents. Balance sheets, inventory books, and main ledgers, however, must be kept in their original form. Special permission can be granted by the Ministry of Finance, however, to keep all accounting information except official balance sheets on microfilm. It is expected that by 1974 the law will be liberalized further, but the impact on micrographic sales would be moderate compared with other trends in the market.

Competitive Environment

Micrographics imports, which now account for 70% of the total German micrographics market, are expected to continue growing at a slightly slower rate than the market itself (28% as opposed to 30%). About half of the German imports of micrographics products are exported directly from United States factories. This share may decrease as the production of some American products is transferred to Europe. Total U.S. micrographics direct exports, however, are expected to increase, even though their share of the market may decline slightly.

German producers hold 30% of the micrographics market. There are several German microfilm manufacturers, such as Mikrofilm GmbH (Agfa-Bevaert), Microbox, Kalle AG, and Alos GmbH, some of whom are sizable suppliers. Subsidiaries of U.S. firms also play a strong role, accounting for approximately 60% of German micrographics production.

Local production is expected to grow from \$10.8 million in 1971 to \$48.3 million in 1976. It is anticipated that exports will exceed this rate of growth as large multinational companies concentrate some production for the EEC market in Germany and some of the small but very active German producers expand their presently limited marketing efforts abroad. In

1971, German micrographics manufacturers exported 45% of their production, with 25% of these exports going to the United States. German production of reader/printers, in particular, has been and is expected to increase.

Four corporations presently hold about 85% of the German market for micrographics, with Kodak holding the largest share. Mikrofilm GmbH, a German company, which merged with Agfa-Gevaert, offers film, a limited range of micrographics equipment—rotary cameras, processors, readers for roll film, and microfiches—and one COM unit. Mikrofilm's share of the film market is 35%, making it the largest German producer of microfilm, and its share of the total micrographics market is 20% (excluding service). 3M GmbH, an American subsidiary, sells much of the 35mm. equipment used by engineering departments of industrial corporations. Microbox, with about 20% of the 35mm. micrographics market, is the leading German producer of readers for technical applications. Microbox also sells a large volume of reader/printers and is the second largest German producer of microfilm. Other suppliers of micrographics products include Bell & Howell, Kalle, Alos, NCR, Rank Xerox, Sperry Rand, Memorex, Datagraphics, and Calcomp.

It is estimated that 80% of all COM's in Germany are leased or rented, to minimize the risk of obsolescence. Leasing terms, while not standardized, usually include servicing and provide for an option to purchase 1 or 2 years after the signing of the lease. There is no special tax advantage to leasing in Germany.

Low Import Tariffs.—Germany is a member of the EEC and of the General Agreement on Tariffs and Trade (GATT). Duties on imports of industrial goods among EEC countries have been eliminated, and duties on imports from non-EEC countries, including the United States, are now subject to the EEC's common external tariff rate. Table 4 lists current customs duties for micrographics products. Imports from all countries also are subject to an 11% import equalization tax on the cost, insurance, and freight (c.i.f) price, which is equivalent to the value added tax paid by local manufacturers.

Detailed information on Germany's foreign trade regulations is available in the U.S. Department of Commerce publication, *Foreign Trade Regulations of the Federal Republic of Germany*, OBR 68-30, April 1968.

Sales Development

All large German firms have showrooms where potential clients are given demonstrations, but direct sales calls remain the most effective method of selling micrographics products.

The Mikrofilm group within the Ausschuss fuer Wirtschaftliche Verwaltung (AWV) in Frankfurt, Gutleutstrasse 163-167, acts as the German microfilm trade association. This group promotes microfilm by organizing seminars and workshops and by publishing books on the use and economics of microfilm. The 1971 amendment of the law pertaining to legal status of microfilm credits this group with developing standards for microfilming.

Table 4.—Germany. Customs duties for imports of micrographics equipment and supplies

Brussels Tariff Nomenclature	Description	Rates applicable to imports from outside the EEC (% Ad Valorem)
9007	Special photographic equipment for photocopying documents, for the preparation of negatives, for printing cylinders (all micrographics equipment except COM, reader/printer, and recorder)	13
9009	Fixed projection equipment used to enlarge or reduce photocopies, (readers, and reader/printers are included)	10.5
3072	Sensitized films in reels or strips (nonperforated)	12.8
8453	Automatic information processing equipment and peripherals (COM readers included)	7

Note: There are no other special restrictions on imports of micrographics equipment and supplies, and such imports are submitted to no other labeling standards than those commonly required for all goods.

Most manufacturers of micrographics products participate in the annual Hannover Fair. In addition, the first European Micrographics Conference and Exhibition was held in Mainz in November 1972 and was sponsored by the AWV and the Verband der Deutschen Photographischen Industrie e.v., Feldbergstrasse 45, 6 Frankfurt/M2.

Only one German magazine is devoted primarily to micrographics, although its circulation is limited. It is:

Repro- und Micrographie, Informatik
Organisation Praxis
International Public Relations
638 Bad Homburg

Other magazines concerned with micrographics include:

Bin, Büro Information Technik
bit Verlag
Sofienstrasse 28
758 Baden Baden

Der Erfolg
Hans Holzmann Verlag KG
Postfach 468
8937 Bad Woerishofen

BTO, Bürotechnik und Organisation
Robert Goeller Verlag
Baden Baden

Technical Standards

Throughout Germany, electric power voltage is 220-

volts, single-phase, 50 hertz, while 380-volts, 3-phase, 50 hertz also is used. Three-pin plugs are used for attachments. U.S. standards for wiring are acceptable.

The metric system of weights and measures is used in Germany and all equipment should be calibrated for metric measurements where applicable.

Exports to Germany should meet Deutsche Industrie Normen (DIN) industrial standards. Details can be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018.

Microfilm size preference is concentrated almost exclusively in the 16mm. and 35mm. range, with the former size accounting for about four times the value of the latter.

Trade sources estimate that of the film sold in Germany, by value, 73% is of the silver halide type, 22% is diazo, and 5% is thermal.

The standard microfiche (105mm. x 48mm.) is the same size as in the United States, but some German organizations such as the Bundespost, use a special size (18cm. x 24cm.). Reduction ratios in Germany also are the same as in the United States.

A loan copy of basic research report "Micrographics—Germany" DIB 73-03-505, upon which this Export Market Digest is based, may be obtained from the Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

Italy

Italy is an excellent market for micrographics equipment, with large banks and industrial corporations already installing advanced systems, including computer-output-microfilm (COM) equipment. The central government has not adopted microfilm as rapidly as certain other European governments, but the Milan city government and the National Library in Florence are sophisticated users of micrographics equipment. Insurance companies and hospitals in Italy presently are limited users of micrographics but offer attractive potential for future sales. With the sales of micrographic products expected to total \$39 million during the 5 years from 1972 through 1976, the Italian market presents excellent opportunities to U.S. manufacturers of microfilm equipment and supplies.

Highlights

► Italy's micrographics equipment and supplies market, totaling \$4.7 million in 1971, is expected to almost treble by 1976 to \$12.4 million.

► Italy imports 80% to 90% of its micrographics needs, with these imports forecast to total \$10.8 million in 1976.

► Nearly 60% of Italy's micrographics requirements is imported directly from plants in the United States.

► In Italy private corporations and public agencies show a strong interest in advanced methods for information storage and records management.

► Italian bankers and industrialists have begun to use computer-output-microfilm (COM) systems, with 1976 COM sales forecast to reach more than \$2 million.

Market Shows a Strong Upswing

The Italian micrographics market has advanced steadily since 1969, when sales of equipment and supplies totaled \$2.8 million. In 1971, these sales rose to \$4.7 million, 80% of which was for equipment, including the sale and installation of five COM systems. The remaining 20% of the 1971 market was for microfilm and other micrographics supplies.

Total expenditures for micrographics products are forecast at \$12.4 million for 1976, almost a threefold increase over 1971, with \$9.2 million to be spent for equipment and \$3.2 million for supplies. Highest growth in equipment sales is expected to be in readers, reader/printers, and COM systems. Diazo microfilm is expected to lead the growth in supplies sales.

Increased demand also is expected for micrographics services offered by firms specializing in such services. Expenditures for services increased from \$120,000 in 1968 to \$380,000 in 1971 and are conservatively forecast to reach \$1 million annually by 1976.

Nearly 60% of Italy's micrographics imports is obtained directly from the United States. The U.S. share of the micrographics market was \$1.3 million in 1969 and it climbed to almost \$2.3 million in 1971. West Germany supplies 15% of Italian micrographics imports; the United Kingdom, 13%; and France, 7% (see table 3). Including imports from foreign subsidiaries, the market share held by U.S. corporations is estimated to run 80% to 90%.

Specific Sales Opportunities

During the 5 years from 1972 through 1976, Italy is expected to consume approximately \$40 million worth of micrographics equipment and supplies, mainly

from U.S. manufacturers. An extensive market survey recently conducted for the U.S. Department of Commerce reveals high growth prospects for the following American micrographics products:

- Automatic step-and-repeat microfiche cameras
- 16mm. roll film and cartridge reader/printers
- Aperture card jacket and microfiche reader/printers
- Cartridge-type 16mm. COM compatible reader/printers
- 16mm. roll film and cartridge readers
- Alphanumeric off-line COM systems
- Alphanumeric on-line COM systems
- Films and supplies, all types
- Microfilm jacket mounters

Many other types of American microfilm equipment and supplies also have good sales potential in Italy, as indicated in this report.

Cameras.—Cameras account for the largest single portion of the Italian micrographics equipment market. Total camera sales in 1971 were nearly \$1.3 million, of which almost \$1 million were in the 16mm. category; approximately 50% of the 16mm. camera sales are for small, inexpensive cameras used for microfilming checks. The Italian firm, Buic SpA, dominates this sector of the market. By 1976, total camera sales should reach \$2.5 million, almost double the 1971 level.

In general, sales of inexpensive microfilm cameras will tend to be made by European suppliers, while U.S. plants will continue to export advanced equipment to Italy. There could be high sales potential for American manufacturers of large flow-type cameras if Italy passes a law accepting microfilm as legal evidence. Some Italian companies, such as Olivetti, are considering microfilming their catalogs and sales brochures and

providing salesmen with inexpensive portable readers, which could increase microfiche usage considerably.

Sales of U.S. automatic step-and-repeat cameras should expand rapidly over the next few years as the use of microfiche becomes more widespread; sales of these cameras are expected to approximate \$115,000 in 1976, up from \$24,000 in 1971. Small camera sales mainly those used for checks, will expand at about 10% per year and may be made mostly by Italian manufacturers.

Readers.—Reader sales in Italy are expected to triple from the 1971 level of \$725,000 to \$2.1 million by 1976. In 1971, sales of roll film readers totaled \$400,000, roll film and cartridge readers sales totaled \$155,000, and sales of aperture card and microfiche readers totaled \$170,000. There have been complaints about the high cost of readers, and two Italian firms, Buic and Microfilm Fotostat, have begun to manufacture some relatively inexpensive readers. Local trade sources estimate the highest sales potential for American manufacturers will be in roll film and cartridge readers which are compatible with COM systems. The combined market for these COM-compatible readers is expected to reach about \$525,000 in 1976, more than triple the \$155,000 worth sold in 1971.

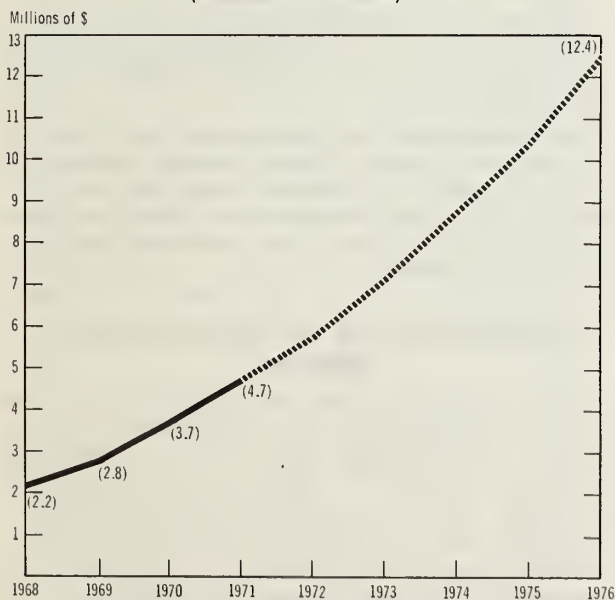
By 1976, sales of roll film readers should total \$1,150,000, and sales of aperture card and microfiche readers should total \$490,000. Approximately 80% of these markets should continue to be supplied by imports, with U.S. suppliers dominating the market for the most advanced types of equipment.

Computer-Output-Microfilm (COM) Devices. — In 1971, sales of COM systems ranked third, after cameras and readers, and were the fastest growing sector of the micrographics market. The first COM system in Italy was installed in 1970. Annual sales of COM units are expected to advance from \$685,000 in 1971 to over \$2 million in 1976, with about 75% of the sales probably being alpha-numeric off-line systems. The rate of growth for COM systems is projected at about 24% a year over the next 5 years, with virtually all units expected to be supplied from the United States, since it appears unlikely that any Italian or European company will produce COM's in the near future.

Following the installation of the first COM in 1970, five COM's—all of U.S. origin—were delivered to Italian customers in 1971. Sales of \$5.85 million in off-line alphanumeric systems are forecast for the period 1972 through 1976. Large firms, institutions, and service bureaus, and particularly banks and insurance companies, are expected to hold the highest sales potential for COM recorders. During the same 5-year period, sales of the less expensive on-line alphanumeric COM recorders are expected to exceed \$1.4 million, while sales of other alphanumeric and graphic systems should total about \$700,000.

Concurrently, COM services are expected to expand. The Italian Government, which does not plan to buy COM recorders in the near future, will rely on service bureaus to fill its COM needs for the next 3 to 4 years. COM services also are expected to be offered by banks and insurance companies which have excess time available on their COM systems.

Figure 1. - Italy: Micrographics equipment and supplies market, 1968-71; and projected 1972-76
(in millions of U.S. dollars)



Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Italian trade estimates and survey of Italian end-users.

Table 1.—Italy: Size of market for micrographics equipment and supplies, 1969-71, and the projected market sizes for 1972, 1973, and 1976

(in millions of U.S. dollars)

	1969	1970	1971	1972	1973	1976
Production .....	.6	.8	.9	1.0	1.3	2.3
Imports	2.3	3.1	4.0	5.0	6.3	10.8
Exports .....	.1	.2	.2	.3	.4	.7
Consumption	2.8	3.7	4.7	5.7	7.2	12.4

Source: U.S. Department of Commerce, Bureau of International Commerce market research study, based on surveys of Italian end-users.

Reader/Printers.—The 1971 reader/printer market in Italy was estimated at about \$312,000, of which \$114,000 was for roll film and cartridge type; \$160,000 was for aperture card jacket and microfiche type; and \$40,000 was for inexpensive microfiche reader/printers. Sales should increase to \$880,000 by 1976, with sales of roll film and cartridge type reader/printers expanding at a lesser rate than the other types. Although sales of reader/printers, like those of readers, are price-sensitive, Italian firms are not expected to enter the manufacture of this equipment to the extent they have with readers because of the more advanced technology involved. U.S. manufacturers should continue to excel in the market for reader/printers, with competition to be expected from German, Italian, and English firms. With the anticipated rise in the use of COM systems, higher sales are foreseen for cartridge type, COM-compatible, reader/printers normally used in quantity with a COM system. The demand for this model should increase by about 25% per year, reaching an estimated market of \$370,000 in 1976. Sales of lower-cost microfiche reader/printers should reach about \$150,000 in 1976, while sales of roll film and cartridge reader/printers should total \$360,000.

Duplicators.—Microfilm duplicators are almost all imported, with sales totaling \$122,000 in 1971. Duplicator sales are forecast at \$260,000 by 1976, with about \$180,000 worth being imported. U.S. and German suppliers each hold about 45% of the market at present. In the future, sales of the more expensive models should increase. Microfilm duplicators are not in much demand at present, with some Italian firms using cameras which can imprint two films at the same time.

Enlargers.—The market for enlarger/printers was \$90,000 in 1971 and is expected to grow to \$190,000 by 1976. There is no Italian manufacture of this type of equipment and none is foreseen, so this market will be entirely open to imports for the foreseeable future.

Processors.—Sales of microfilm processors totaled \$160,000 in 1971, with about 20% being produced by local firms. Sales in 1976 are forecast at \$296,000, with about 12% expected to be produced locally. Italian firms manufacture small processors, and it is believed that German firms may surpass U.S. firms to some degree as suppliers of large processors. Sales of processors also may be impeded somewhat by the practices of some film suppliers who include processing costs in the price of film.

Mounting Equipment. — Foreign manufacturers should remain the sole suppliers to Italy of aperture

card mounters and microfilm jacket mounters. Sales of aperture card mounters are forecast at \$25,000 for 1976, up from \$13,000 in 1971, and sales of microfilm jacket mounters are forecast at \$100,000 in 1976, up from \$37,000 in 1971. U.S. predominance in this market sector is expected to continue.

Automatic Retrieval Devices.—Only one microfilm automatic retrieval device is known to have been sold in Italy. Italian firms do not seem to envisage a need for this type of equipment, and its sales potential seems somewhat limited in the near future.

Supplies.—Sales of all types of microfilm supplies in Italy totaled \$770,000 in 1971 and by 1976 should total \$2.7 million. Italian firms produced \$90,000 worth of microfilm paper and chemicals in 1971, supplying almost half the market, and they should supply about 65% of the projected \$460,000 Italian market for paper and chemicals in 1976. Kodak and Agfa now dominate exports of microfilm to Italy, with the film coming from plants in the United States, United Kingdom, Germany, France, and Belgium. Market shares for the types of film used in 1971 and projected for 1976 were:

	1971	1976
Silver halide	75%	60%
Diazo	20	30
Vesicular and others	5	10

The rapid growth forecast for sales of microfilm supplies and the change in market share are due in large part to the expected increase in the purchase and use of COM systems.

The Italian market for aperture cards and jackets is also totally supplied by imports, which amounted to 60 million and 210 million units, respectively, in 1971. Sales are forecast at 100 million and 550 million units, respectively, in 1976. This market also is supplied mainly by U.S. corporations.

Italian Demand for Micrographics Spurred

Italy's economy has been expanding rapidly for the past decade, but procedures for paperwork have remained fairly traditional. Banks and large industrial companies, together with certain government agencies, have been the first to purchase micrographics equipment, although there has been considerable interest in micrographics by scientific, medical, and educational organizations. The commercial and industrial sectors of the Italian economy probably will continue to be the two best markets for micrographics equipment, together

Table 2.—Italy: Sales of micrographics products 1971 and projected 1976

(in millions of U.S. dollars)

Micrographics equipment	1971	1976
Cameras	1.3	2.5
Readers .....	.7	2.1
Computer-output-microfilm devices .....	.7	2.1
Peripheral items .....	.4	1.0
Readers/printers .....	.3	.9
Processors .....	.2	.3
Duplicators .....	.1	.3
Total	3.7	9.2
Micrographics supplies	1.0	3.2
Grand Total	4.7	12.4

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Data are based on surveys of Italian end-users.

accounting for about 75% of the country's total purchases (See table 4).

Commercial.—Banks are by far the largest end-users of micrographics in Italy, with sales totaling \$2.1 million in 1971. Banks alone account for 45% of the Italian micrographics market. Of the 458 Italian banks with deposits totaling over \$64 million, there are 16 with more than \$1 billion in deposits. Most Italian banks use microfilm, usually for record storage and for certain security purposes. Banks account for most of the sales of simple roll cameras, with which they microfilm all checks, promissory notes, payment advice slips, customer statements, securities, and credit applications. The most popular equipment is 16mm. made by Kodak, Bell & Howell, and Buic SpA. Relatively few processors are used because films from the branches are processed in a regional center.

Some banks are already using advanced microfilm equipment. At the Banca d'Italia, for example, all studies regarding the banking sector are microfilmed, and a microfilmed documentation center is at the disposal of all other banks in Italy. This bank is presently evaluating the advantages of installing COM equipment.

Credito Italiano, Milan, with deposits totaling nearly \$8 billion in 1971, has a system for microfilming checks, travelers' checks, payment advice slips, and customer statements in regional centers. This bank has installed five microfilm centers, all using Kodak equipment with readers available in the large branches. Each of the five Credito Italiano microfilm centers has a Recordak Reliant 500 with a PVM Starmatic Reader and a Recordak Prostar film processor. Istituto Bancario San Paolo di Torino (Torino), with total deposits of \$2.1 billion, uses 150 Buic small cameras for microfilming checks at their branches. Banca d'America e d'Italia, Milan, with \$1.5 billion in deposits, uses four cameras (two from Minnesota Mining and Manufacturing Company (3M) and two from Microfilm Fotostat to microfilm checks.

Banks offer an excellent market for COM's, especially the lower cost on-line version. The Cassa di Risparmio Trevigiana already has installed a Memorex on-line COM. Optimation Italcenro, a subsidiary of Credito Italiano, has purchased a 3M EBR COM and intends to offer COM services to the bank's customers. Reader,

reader/printer, and diazo film sales to banks are expected to increase markedly, partly due to expected COM sales.

Insurance premiums in Italy totaled \$2.24 billion in 1971. Automobile insurance is the largest selling type of insurance, representing about 44% of total premiums received. Three insurance companies—Gruppo Istituto Nazionale Assicurazioni (INA), Gruppo Assicurazioni Generali, and Gruppo Riunione Adriatica di Sicurtà—control 67% of the total insurance business in Italy. The use of microfilm by insurance companies has been limited because all original documents must be kept on file. Insurance companies account for only 5% of the total Italian micrographics market. Some companies, such as Gruppo Generali, with premiums totaling \$500 million in 1970, use micrographics only for security purposes. However, the Gruppo Generali is now considering the use of micrographics for other purposes and has been in contact with some U.S. manufacturers in order to evaluate their equipment. On the other hand, Alleanza Assicurazioni, Milan, with total premiums of \$80 million in 1970, already uses microfilm jacket files. This bank has four Bell & Howell cameras, an Agfa developer, and 24 Bell & Howell readers. Approximately one million jackets are now being used, and about 150,000 new jackets will be needed each year by this firm. Several other insurance companies also use microfilm jackets for client files and for security purposes.

Industrial firms in Italy comprise about 25% of the micrographics market, having purchased almost \$1.2 million of micrographics products in 1971. Both 16mm. and 35mm. equipment are used by industrial corporations, with most of the 35mm. microfilm for technical drawings and similar uses inserted into coded aperture cards. Italian firms also receive a large amount of aperture cards from U.S. licensors. These firms use 16mm. equipment for microfilming correspondence and bills.

The automobile industry is one of the largest and most dynamic in Italy and is an important microfilm user. Fiat, the largest automotive manufacturer, with total investments of \$294 million in 1970, uses 35mm. film for technical drawings and parts lists. Fiat presently has 100,000 drawings on 35mm. aperture cards and 300,000 drawings on paper. The company expects to microfilm an average of 20,000 to 25,000 new drawings each year for the next 5 years. Two COM systems were purchased very recently (one off-line 3M EBR at Fiat Ricambi and one on-line Memorex 1663 at Fiat Osa). Fiat generally uses 16mm. microfilm for registering correspondence and employee time sheets.

Alfa Romeo, the second largest automobile manufacturer in Italy, does not yet use microfilm for technical drawings and has no COM equipment. They have formed a study group, however, to examine the usefulness of microfilm to their firm and have shown interest in hearing from U.S. micrographics equipment manufacturers.

Other large industrial firms also are significant users of microfilm. Olivetti (with sales of \$400 million) rents a 3M EBR COM system and 40 readers for use in microfilming all computer output, which is distributed

Table 3.—Italy: Total imports of micrographics products by countries of origin, 1969-71

	1969		1970		1971	
	Value (\$1000) ¹	Market share percent	Value (\$1000)	Market share percent	Value (\$1000)	Market share percent
United States	1,320	57	1,666	54	2,280	56
Germany	300	13	480	15	610	15
United Kingdom	340	15	450	14	510	13
France	175	8	230	8	290	7
Others	174	7	264	9	335	9
Total	2,309	100	3,090	100	4,025	100

¹ \$1=625 Italian lire, dollars value is market price to end-user.

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Data are based upon Italian trade estimates.

to more than six locations. The company has one 35mm. microfilm installation and plans to buy a second. Innocenti SpA, a diversified manufacturer, has installed a 35mm. microfilm system to record 45,000 to 50,000 technical drawings and patents each year. Innocenti also uses 16mm. microfilm to economize file storage space. They use Kodak MRG1 and MRD2 cameras.

The Italian chemical and pharmaceutical industry, with total sales of \$2.9 billion, is another important market for micrographics equipment. Montecatini Edison, with sales of \$1.05 billion, uses micrographics equipment to register correspondence and to economize filing space, as does Lepeti, a subsidiary of Dow Chemical with sales of \$160 million. Pirelli SpA, the rubber manufacturer, with total sales of \$435 million in Italy, uses 35mm. aperture cards for technical drawings and 16mm. microfilm to store documents. Two planetary cameras, a Kodak and a Remington, are used for 35 mm. applications, while a Kodak camera and Microfilm Fotostat equipment are used for 16mm. filming.

It is anticipated that large corporations such as Montecatini Edison, Alfa Romeo, and Pirelli will buy COM time from service bureaus within the next 2 to 3 years and eventually will purchase or lease their own COM systems. Smaller organizations will, in all probability, also start to use COM service bureaus for such procedures as updating of parts lists. Italy currently has only one COM service center, Optimization Italcenro, which has a 3M EBR machine.

Government.—The Italian central government makes little use of micrographics because microfilmed documentation is not recognized as legal evidence in Italy. Also, the backlog of documents which would have to be microfilmed concerns some officials who are accustomed to dealing with paper rather than microfilm readers. Although a limited amount of micrographics equipment is used by the Ministry of the Interior, the Ministry of Finance, and the Ministry of Defense, the Istituto Central di Statistica (ISTAT), Italy's central statistical authority, does not use any micrographics equipment. One or two city governments have started to use microfilm, with Milan having recorded 17,000 bound volumes of vital statistics on microfilm. The government sector is believed to have high potential for micrographics sales, provided that officials can be convinced of the advantages of microfilm systems and especially if the law on documentation storage can be changed.

Kodak SpA and Microfilm Fotostat equipment presently is most often used in government facilities. U.S. products are not discriminated against, but the lowest cost equipment often is bought under competitive bidding procedures.

Other Users.—The balance of the micrographics market in Italy is presently comprised of smaller purchasers, some of whose micrographics needs may expand substantially in the future. In the scientific field, the European Economic Community (EEC) research center, Euratom at Ispra (a nuclear research facility), will be procuring within 2 years a complete microfilm system, 35mm. and 16mm., with the intention of using microfilm for the recording and analysis of scientific data. Other scientific organizations are potential but untapped markets for micrographics equipment.

The majority of Italy's 2,400 hospitals (540,000 beds) are financed through the social security system and have been incurring deficits in recent years. One hospital, the Ospedali Riuniti of Rome, is experimenting with the use of a jacket system for each patient's file. Hospitals have a real need for micrographics equipment, but this market may not be developed for 5 or 10 years because of lack of funds.

Microfilm use in universities is centered around readers for library material coming in the form of rolls or microfiche from the United States. Universities in Italy are controlled by the State and also are hard pressed for funds. Sales potential for micrographics equipment to universities, therefore, is expected to remain fairly dormant in the near future.

Apart from university libraries, 34 public libraries in Italy are controlled by the Ministry of Education. Some have readers for microfilm received from libraries abroad. Because libraries are somewhat short of funds, they are considered only as long-range prospects for microfilm products.

Neither Mondadori, Italy's largest publishing house (sales \$122 million), nor Rizzoli (sales \$73 million) is engaged in micropublishing. Rizzoli, however, plans to invest about \$80,000 in micrographics equipment within the next year or two, so that the 40 million documents in its library can be classified and made available to inquiring journalists within 10 minutes. The firm appears willing to spend more if a system particularly suited to its needs can be offered. They presently handle about 400 requests for information each day.

Table 4.—Italy: Value and market share of micrographics consumption by principal user sectors, 1971

Sector	Value (\$1000)	Percent
Commercial	2,330	50
Industrial	1,165	25
Government	700	15
Other (including libraries, medical facilities, service centers)	470	10
Total	4,665	100

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Italian estimates.

Microfilm has been used extensively to preserve some of Italy's works of art and precious manuscripts. The National Library of Florence, for example, has been using six Kodak MRD cameras, a Kodak Prostar processor, and a Karlson DePue printer since the flood of 1966 to microfilm its books and documents. A Xerox system is being used to microfilm the old catalog system and place it on standard library cards.

Service Centers.—Aside from the Italian firm Etimar SpA, most of the 11 service centers in Italy are either operated or financially assisted in some way by microfilm equipment manufacturers. These centers work mostly (60%) with 35mm. equipment. Their sales totaled \$350,000 in 1971 and are expected to grow by 28% to 30% per year as more medium-size Italian firms begin to use microfilm. Kodak SpA and the Italian service center Optimization Italcentro provide COM services, which should grow as medium-size banks begin to use COM systems.

Legal Aspects of Microfilm Usage

A law to recognize microfilm as legal evidence in Italy was passed on January 4, 1968, but the regulations implementing the law were rejected by the business community as being too complicated. The Italian microfilm association (AIMI) is lobbying for simpler regulations in order to implement this law. Some firms are waiting for these regulations to be passed before they purchase microfilm equipment. Because microfilm is not yet recognized by the courts to have the same value as the original, all originals of industrial documents and correspondence must be kept for at least 10 years and public documents must be kept for 40, 70, or 100 years. Should favorable regulations pass, sales of 16mm. micrographics equipment might experience a 7% to 8% increase during the first year, almost all from imports, and an additional 4% to 5% each year thereafter.

Competitive Environment

Italy's production of micrographics equipment and supplies totaled \$881,000 in 1971 and is projected at \$2.26 million for 1976. Micrographics exports totaled \$243,000 in 1971 and are expected to reach \$666,000 by 1976. Buic SpA, an Italian firm, is strong in sales of small 16mm. cameras to the commercial sector (banks and insurance companies) and holds 80% of the small camera market used for microfilming checks.

Smaller processors, inexpensive readers and reader/printers, are also manufactured in Italy.

Important manufacturers of micrographics equipment for the Italian market are: Kodak SpA, 3M SpA, Bell & Howell (through their agent, Gallo Pomi), Rank Xerox SpA, Remington Rand SpA, Memorex SpA, Agfa-Gevaert (German manufacturer), Microfilm Fotostat (Italian manufacturer), and Buic SpA (Italian manufacturer). Five U.S. companies presently account for most of the estimated \$2.3 million of micrographics equipment and supplies exported from the United States to Italy. The other 44% of Italy's micrographics imports come mostly from Germany, England, and France, although some of these imports come from European plants or subsidiaries of U.S. corporations.

Micrographics imports are expected to grow at the rate of 21% per year, closely paralleling the growth of the market. The U.S. share of micrographics imports is likely to drop from 56% to about 50% as European competition increases, especially in sales of supplies. Obviously, this forecast does not take into account the possibility that U.S. firms may transfer certain additional equipment manufacturing operations to Europe. West Germany, the second largest country supplying micrographics products to Italy, is especially strong in film sales. American and German firms each supply 45% of the microfilm and supplies market. Most large processors used in Italy are German, although U.S. processors run a close second. The camera market is shared by 3M, Kodak, and Agfa Gevaert. U.S. corporations, however, dominate the market for COM equipment. A Dutch and a Japanese manufacturer of printers have just recently entered the Italian market, one through a sales subsidiary and one through an Italian agent.

All equipment, apart from COM, is purchased rather than leased because there is no tax advantage to leasing in Italy. COM equipment apparently is being leased because of the higher purchase costs involved.

Import Duties.—The European Economic Community, of which Italy is a member, has established a uniform duty on imports from third countries, while duties on imports from within the EEC have been abolished. Italian import duties are levied on the cost, insurance, and freight (c.i.f.) price of imported goods. Due to the wide range of products covered in this guide, it is impractical to list specific import duties. However, applicable duties on micrographics equipment imported from the United States range between 10.5 and 13% (See table 5).

On January 1, 1973, the value added tax (TVA) was introduced in Italy, replacing the turnover tax and compensatory import tax. The rate on microfilm equipment is 12% of the c.i.f. duty-paid value. The TVA will apply to all manufactured products, including those made in Italy.

Sales Development

The majority of micrographics suppliers in Italy have their main offices and demonstration showrooms in Milan. Most sales (about 90%) are made in Milan, Turin, Rome, Genoa and in their industrial suburbs, with Rome accounting for most of the central govern-

Table 5.—Italy: Common external tariff rates on micrographics, 1972
(in percent, ad valorem)

Brussels Tariff Nomenclature	Description	Rates Applicable to Imports not from the EEC
9007-11 (Italian nomencl. 9007-01)	Special photographic equipment for photocopying documents for the preparation of negatives, for printing cylinders. (Includes all micrographics equipment less supplies, readers, and reader/printers)	13.0
9009-10 (Italian nomencl. 9009-10)	Fixed projection equipment; equipment used to enlarge or reduce photocopies. (Includes readers and reader/printers)	10.5
9009-40 (Italian nomencl. 3702-40)	Sensitive films in reels or strips, nonperforated.....	12.8

Note: All Kennedy Round reductions have, by now, been put into effect and no further reductions are planned.

On January 1, 1973, Italy will implement its value added tax (TVA). The TVA rate has not yet been decided for micrographics equipment, but probably will be 12%.

ment purchases. Because after-sales service is considered essential, it is desirable to have branch offices in regional centers such as Rome and Turin.

Payment is normally scheduled 30 to 60 days after delivery. Government agencies and large firms generally require more flexible terms (180 to 270 days from delivery), and it would be very difficult to sell to large companies unless their demands on payment terms are met.

The installation cost is included in the selling or renting of micrographics equipment, and the maintenance and servicing costs are normally covered by a separate yearly contract, with charges during the first year being typically 2%.

Customary markups are 25% to 30% for a local producer, 30% to 40% for a foreign corporation through its own sales subsidiary, and 30% to 35% for a foreign corporation through its Italian agents.

The best way to make sales is by personal calls. Mailing lists and magazine advertising are also effective.

The following magazines are suggested for the advertising of micrographics products:

Ufficiostili—an office equipment magazine. Monthly.
Viale Stelvio 21—Milano

Microsistemi—the magazine of the Associazione Italiana per i Microfilm. Monthly. Via Podgora
14—Milano

Successo—a general business magazine, similar to

FORTUNE. Monthly. Address for advertising:
Nuova Pubblicità Illustrati SpA. Via Pirelli 30—
Milano 20124

Tempo Economico—Monthly. Editrice Fratelli Pini.
Via Alberti 10—Milano

The International Micrographic Congress Journal—
13388 Hammons Avenue—Saratoga, California
95070

Trade fairs and exhibits also offer a useful way to promote micrographics sales. An international exhibition on office equipment (SMAU), organized by Associazione Nazionale Commercianti in Macchine e Forniture per Ufficio, is held in Milan each fall. Visitors number about 50,000 and foreign firms are welcome. During the SMAU, a seminar is prepared by the Associazione Nazionale Italiana Microfilm (AIMI) for the presentation of papers on micrographics applications and techniques.

A loan copy of basic research report "Micrographics—Italy," DIB 73-03-509, upon which this export market digest is based, may be obtained from the Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

Japan

Japan, a leading industrial power, with a population of 100 million and one of the most efficient and fastest growing economies in the world, is an excellent market for U.S. micrographics equipment. Sales of micrographics products more than tripled from \$3.5 to \$11.6 million between 1968 and 1972 and should more than double to \$25 million by 1976. Several Japanese manufacturers supply three-fourths of the micrographics market, while imports—mainly of more specialized and advanced equipment, originating in the United States—meet remaining requirements. U.S. exports of micrographics equipment and supplies to

Japan should continue to increase steadily, with the most rapid growth coming from sales of computer-output-microfilm (COM) recorders. Exports of micrographics products from Europe to Japan, on the other hand, have been minimal and are not expected to increase significantly in the years ahead.

Since late 1971, U.S. micrographics products have been attractively priced for Japanese buyers because of realignment of the U.S. dollar with the yen.

Highlights

► Micrographic equipment sales in Japan are forecast to reach a level of \$25 million in 1976, yielding total sales of \$90 million for the years 1972-76.

► Imports are expected to gross \$20 million during the 5-year period, with the annual import level reaching nearly \$5 million in 1976.

► Computer - output - microfilm sales should total \$11 million from 1972 through 1976, with about \$8 million to be imported from the United States.

► U.S. micrographics products supply about 30% of the Japanese micrographics market and account for almost all imports into Japan.

► Banks and service centers now use about half the micrographics equipment presently installed in Japan, and large Japanese corporations appear to be excellent sales prospects.

Imports Mostly from U.S.

As the expected market for micrographics products in Japan expands from \$11.6 million in 1972 to \$25 million in 1976, sales of equipment and supplies are seen making up 85% and 15%, respectively, of total sales through 1976. With cumulative micrographics sales forecast to reach \$90 million from 1972 through 1976, fastest dollar growth is anticipated for sales of computer-output-microfilm recorders, followed by reader/printers, cameras, readers, and processors.

Annual Japanese imports of micrographics products rose from \$1.4 million in 1968 to \$3.3 million in 1972 and by 1976 should reach \$4.7 million. Anticipated aggregate U.S. exports of about \$19 million during the period 1972-76 break down by main products as follows: COM equipment, \$8.1 million; cameras, \$3.3 million; reader/printers, \$2.5 million; supplies, \$2.8 million; processors, \$2.3 million. U.S. exports of COM equipment in 1976 should approach \$2.3 million, followed by \$600,000 worth of cameras, \$560,000 worth of reader/printers, \$500,000 worth of micrographics supplies, and \$425,000 worth of processors.

The only significant competition foreseen for U.S. exporters to Japan will come from Japanese manufacturers of micrographics products, currently supplying 75% of the market. U.S. suppliers account for most of the remaining 25%.

Specific Sales Opportunities

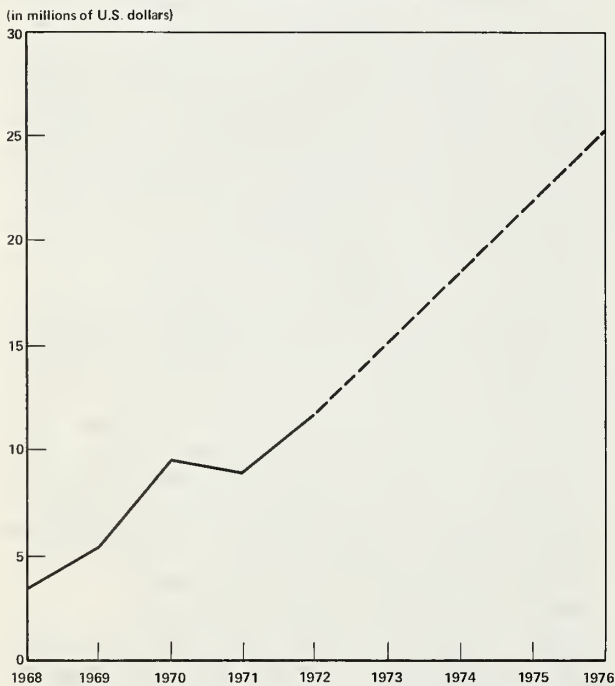
Market research recently conducted in Japan for the U.S. Department of Commerce identifies the following products as having the highest sales potential:

- Alpha-numeric and graphic COM recorders
- 16mm. planetary cameras
- 16mm. rotary cameras
- Inexpensive, compact processors
- Microfiche duplicators
- Aperture card readers
- Microfiche readers
- Roll film readers
- Automatic microfilm processors
- Microfiche reader/printers
- Roll film reader/printers
- Automatic retrieval devices, multi-roll or fiche type
- Microfilm jacket mounters
- Aperture card mounters
- Aperture card microfilm jackets
- Sensitized silver halide film
- Diazo and other duplicating film

The markets in Japan for the various types of micrographics products are summarized as follows:

Computer-output-microfilm devices.—Four Japanese banks, one large industrial firm, and eight service centers now have COM systems in operation. By the end of 1974, about 40 COM systems should be in use for business purposes and about 10 for graphics purposes. Although there are over 11,000 computers in Japan, only about \$2.5 million worth of COM equipment has been installed. COM sales, totaling \$1 million in 1972, should almost quadruple to \$3.8 million in 1976. Some Jap-

Figure 1.— Japan: Size of market for micrographics equipment and supplies, 1968–72, and projected 1976



Source: U.S. Department of Commerce, Bureau of International Commerce market research study.
Values are based on Japanese trade estimates.

anese production of simpler COM recorders began in 1972, but COM imports, mainly from the United States, are forecast to increase from \$900,000 in 1972 to \$2.3 million in 1976.

Most users of COM equipment to date have been banks or service centers, but a number of Japan's large industrial corporations are considered to be good sales prospects for such equipment. Market analysts believe that sales will be mostly of expensive, multi-purpose COM recorders for several years, after which sales of low-cost, single purpose COM recorders should increase rapidly. Between 1972 and 1976, about \$11 million worth of COM equipment should be sold, with about \$8 million being imported from the United States.

Canon now manufactures COM recorders in Japan. A number of Japanese trading companies, foreseeing rapid growth in COM sales, have secured representation of U.S. suppliers and presently offer the following makes of COM equipment: Calcomp, Kodak, Memorex, Quantor, Recognition Equipment, Stromberg DatagraphiX, Seaco, 3 M, and University Computing.

Reader/Printers.—Reader/printer sales increased fivefold from a 1968 level of \$500,000 to \$2.6 million in 1972 and should more than double to \$5.6 million in 1976. Imports of reader-printers doubled from \$200,000 in 1968 to \$400,000 in 1972 and should continue to increase to \$560,000 in 1976. Sales of readers are considerably less. Some Japanese companies are considering a switch from silver halide film to lower-cost thermal sensitive papers. Best sales potential is for microfiche recorder/printers, followed by roll film reader/printers, and—to a lesser extent—by aperture card reader/printers. Sales of some reader/printers will be made in conjunction with automatic retrieval systems.

Reader/printers are manufactured by the following Japanese firms: Canon, Fuji Photo, Iwasaki Tsuchinki, Minolta, and Ricoh. U.S. firms marketing their reader/printers in Japan include Bell & Howell, Itek, Kodak, Stromberg-DatagraphiX, and 3M.

Cameras.—With sales expanding from \$1.2 million in 1968 to \$4 million in 1972, microfilm cameras account for one-third of all micrographics sales in Japan. Sales should more than double to \$8.4 million by 1976. Imports of microfilm cameras almost doubled from 1968 to 1972, when they totaled \$700,000, but their growth is expected to slacken in the mid-1970's.

Demand for 16mm. planetary cameras is expected to increase most rapidly, while sales of 35mm. cameras probably will decline. Sales of 16mm. rotary cameras, used primarily by the banks, also should increase rapidly. Japanese firms use microfilm cameras to record data in a variety of sizes and formats and tend to prefer multi-purpose equipment. These users also require cameras with high-resolution lenses in order to accurately reproduce the complex characters of the Japanese language.

A variety of cameras are produced in Japan by Canon, Fuji Photo, Hirakawa Kogyosha, Information Systems Laboratory, Konishiroku Photo, and Minolta. Microfilm cameras are imported from several U.S. firms, including Bell & Howell, Kodak, Itek, Regiscope, Sperry Rand, and 3M.

Processors.—Sales of microfilm processors increased

Table 1.—Japan: Size of market for micrographics equipment and supplies, 1968-72 and projected 1976
(in millions of U.S. dollars)

	1968	1969	1970	1971	1972	1976
Production	2.4	3.6	7.5	6.7	8.8	21.5
Imports	1.4	2.0	2.5	2.6	3.3	4.7
Exports	0.3	0.3	0.5	0.4	0.5	1.1
Size of market	3.5	5.3	9.5	8.9	11.6	25.1

Note: Size of market equals production plus imports minus exports.

Source: U.S. Department of Commerce, Bureau of International Commerce market research study.

from \$650,000 in 1968 to \$1.1 million in 1972 and should expand further to over \$1.8 million in 1976. Imports supplied half of this market in 1968, but are now expected to level off at the 1972 sales volume of \$500,000. Compact, low-cost, simple processors have accounted for most market growth, and the sales potential of large processors has been moderate. Sales of automatic developers should increase, however, after 1972.

Canon, Fuji Photo, and Somaru Industries manufacture processors, which also are imported from Bell & Howell, Cordel, Itek, Kodak, K & E, Sperry Rand, Stromberg DatagraphiX, and Technifax.

Readers.—Sales of microfilm readers have increased rapidly from \$200,000 in 1968 to \$600,000 in 1972 and are expected to increase further to \$1.1 million by 1976. Imports of readers totaled \$80,000 in 1968, increased to \$170,000 in 1972, and are expected to maintain the latter level until 1976. Because many companies are cutting 100-foot roll film into fiche size, inserting the fiches into jackets, and disseminating the duplicates within their organizations, demand for microfiche readers should increase rapidly. Roll film readers, on the other hand, should experience more moderate sales growth. A number of Japanese companies plan to furnish every employee who will be using microfilm with a reader.

Although thousands of readers are being sold in Japan each year, the total sales volume seems small because of the low cost of most readers being sold. Readers are made by the Japanese firms Fuji Photo, Konishiroku Photo, Canon, Minolta, Ricoh, Yushodo, Seishosa and are also imported from U.S. firms, including Bell & Howell, Ducane, Kodak, Itek, Microseal, NCR, 3M, Seaco, Stromberg-DatagraphiX, Vu-Tech, and others.

Duplicators.—Sales of microfilm duplicators increased from \$50,000 in 1968 to \$80,000 in 1972 and are expected to level off through 1976. Imports of duplicators, having increased from \$14,000 to \$30,000 between 1968 and 1972, also should level off through 1976. Best sales potential is for microfilm duplicators, some of which will be used to reproduce COM output. Some Japanese companies also cut roll film into fiche size, insert the fiches into jackets, and then duplicate the fiche. Roll film duplicators have been sold only to service centers and to COM installations and should show moderate growth for the next several years.

Duplicators are manufactured by Canon and imported from CBS, GAF, Klcrr-Vu, Stromberg-DatagraphiX, and Technifax.

Automatic retrieval devices.—Sales of automatic retrieval devices were estimated at \$35,000 in 1968 and

\$50,000 in 1972. These sales should increase somewhat in 1973 and 1974 and then level off. Imports have accounted for most of these sales and should supply about half the market in 1976. Fuji Photo and Minolta manufacture automatic retrieval devices, and one U.S. manufacturer exports these devices to Japan.

Peripheral items.—Sales of jacket mounters and aperture card mounters totaled \$105,000 in 1972, up from \$55,000 in 1968, and should continue to \$160,000 in 1976, with imports leveling off at about \$30,000. Demand for jacket mounters to insert 16mm. roll microfilm should be especially high. Aperture card counters are sold primarily to service centers, and sales of these mounters should continue to increase steadily. U.S. companies selling mounters to Japan include Dakota, Kodak, and 3M.

Supplies.—Sales of supplies totaled \$2 million in 1972, almost three times the 1968 level of \$700,000. Such sales should double to \$4 million in 1976, with over \$500,000 worth expected to be imported. Sales of 16mm. film should increase much more rapidly than 35mm., and sales of 105mm. Fiche film also should grow rapidly. Of the types of duplicating film, diazo has the greatest growth potential, followed by Kalvar-type film.

Original film is manufactured by Fuji Photo and Konishiroku Photo Film, while duplicating film is made by Canon, Konishiroku, and Somaru Industries. Microfilm and duplicating film is imported from several U.S. manufacturers.

Micrographics Markets Growing

The use of micrographics began in Japan in the early 1960's and has been expanding rapidly since 1968. The use of COM systems has just begun, with only about \$1.5 million worth of COM equipment sold before 1972. Micrographics equipment was first brought into general use by banks, which were also the first purchasers of COM systems. Banks, other financial institutions and commercial firms presently account for about half of all micrographics products sold in Japan and are expected to remain important customers in the years ahead.

Industrial corporations presently account for about 25% of the market, with many large corporations already using microfilm equipment. One large company has installed a COM recorder and another has purchased an ultra-microfiche system. Sales of all types of micrographics equipment to large industrial corporations are expected to increase most rapidly as top management becomes more convinced of the advantages of micrographics technology.

Table 2.—Japan: Sales of product category by principal subcategories, 1972 and projected 1976 (in millions of U.S. dollars)

	1972	1976
Micrographics equipment:		
Cameras	4.0	8.4
Reader/printers	2.7	5.6
Processors	1.1	1.8
Computer-output-microfilm (COM) devices	1.0	3.9
Readers	0.6	1.1
Other (peripheral items, duplicators, automatic retrieval devices)	0.2	0.3
Total	9.6	21.1
Micrographics supplies	2.0	4.0
Grand total	11.6	25.1

Source: U.S. Department of Commerce, Bureau of International Commerce market research study.

Agencies of the Japanese Government were early users of microfilm and now account for about 10% of the market. At least 20 ministries, agencies or institutes of the Japanese Government now use some micrographics equipment, and the government is expected to remain an important customer. Research institutes and public utilities each account for 5% of the market and the remaining 5% comprises sales to libraries and educational and medical institutions.

Commercial—Many Japanese banks are already using micrographics equipment; four have installed COM systems. Three banks, the Mitsubishi Bank, the Taiyo Bank, and the Mitsubishi Trust Company, have installed Stromberg DatagraphiX Model SD4440 COM recorders, and the Fuji Bank has a Model CMS 7000 COM recorder made by Computer Microimage Systems. COM and all types of micrographics equipment sales to banks and other commercial firms should continue to expand in the years ahead.

The Japan Development Bank, with 1,000 employees and an annual business volume of over \$1 billion, is a typical financial end-user of micrographics products and relies on them primarily as a file for screening the credit of prospective borrowers. Its equipment includes a planetary camera, reader, reader/printer, and a reader/printer with an automatic retriever. It generally uses 16mm. roll film in cassette form. Another firm, the Nikko Trading Company, has organized a microfilm center using 16mm. roll film equipped with a planetary camera, automatic processor, diazo duplicator, reader/printer, electrically operated reader (Japanese made), cartridge loaders (2 units, Japanese made), and splicers (2 units, Japanese made).

The market survey conducted for the U.S. Department of Commerce revealed that a number of very large commercial firms are potential major micrographics customers. These include the securities firms of Daiwa, Yamaichi, and Nikko, all in Tokyo; the insurance firms, Taisho, Yasuda, Dai-ichi, and Ashai, also in Tokyo; Sumitomo Life Insurance of Osaka; the department stores of Matsuzakaya, Matsuya, and Mitsukoshi (Tokyo) and Daimaru and Takashimaya (Osaka); the trading firms of Mitsubishi and Mitsui (Tokyo)

and C. Itoh and Marubeni-Iida (Osaka); and the three leading Tokyo-based daily newspapers—*Asahi*, *Mainichi*, and *Yomiuri*.

Industrial—Many large corporations in Japan are expected to purchase significant amounts of micrographics equipment, including COM recorders, over the period 1972 to 1976. Survey findings indicate that the full potential of sales to industry in Japan has not been realized primarily because insufficient missionary sales efforts have been made to industry.

Following the purchase of a COM system by Hitachi and an ultra-microfiche system by the Nissan Diesel Co., sales of advanced micrographics equipment are expected to develop rapidly. The industrial sector's share of the micrographics market, presently 25%, is expected to expand considerably by 1976.

Chiyoda Chemical Engineering Construction Co., of Yokohama, an early industrial user of micrographics, first began using microfilm in 1963 and has formed an information control division which microfilms and stores engineering drawings, scientific papers, and other reference materials. Present equipment consists of 15 readers and three reader printers, but Chiyoda plans to purchase a COM recorder soon and will set up a system to microfilm all corporate documents and records.

The automotive industry is interested in utilizing ultra-microfiche systems for parts catalogs. The Nissan Diesel Company already has purchased an ultra-microfiche system with 700 readers and reader/printers, and Toyota Motors, Ltd. is considering purchasing a similar system. Other manufacturers, such as Nissan Motors, use microfilm for document storage, and Nissan Motors plans to purchase a fully automated COM system soon.

Illustrative of companies using microfilm primarily for engineering drawings are Idemitsu Industries, the major refiner of oil, which uses two microfiche cameras, a duplicator, four reader/printers, and 12 readers; and the Nagasaki shipyard, of Mitsubishi Heavy Industries, which uses aperture card readers, microreaders, micro-reader/printers, and microfilm printers. Shimazu Seisakusho, a manufacturer of scientific instruments and medical equipment, contracts for the microfilming of its documents and uses microfiche readers and reader/printers to review scientific drawings and research papers.

Hitachi, Ltd., a leading manufacturer of machinery, electronics, vehicles, and ships, with plants in Tokyo, Yokohama, and Osaka, was the first industrial user of COM equipment—a Stromberg DatagraphiX Model SD4440—and is expanding its usage of microfilm systems. Other industrial firms reported to be actively interested in the introduction or expansion of micrographics facilities include the following (unless otherwise noted, all have their headquarters offices in Tokyo): Nippon Oil; Showa Oil; Asahi Chemical Industry (Osaka); Mitsubishi Chemical Industries; Sumitomo Chemical Industries (Osaka); Nippon Steel Corp.; Kawasaki Steel Corp. (Kobe); Toshiba Machine; Tokyo Shibaura Electric Machinery; Ishikawajima-Harima Heavy Industries; Mitsui Shipbuilding & Engineering; Toyota Motors (Aichi); Ricoh Precision Instruments; Taisei Construction; Ohbayashi-Gumi Construction (Osaka); and Shimizu Construction.

Service centers—Micrographics service centers play

Table 3.—Japan: Value and market share of micrographics equipment and supplies by principal end-user sectors, 1972 (in millions of U.S. dollars)

Sector	Value	Percent
Commercial	5.8	50
Industrial	2.9	25
Government	1.2	10
Research .....	.6	5
Public utilities .....	.6	5
Education .....	.2	2
Libraries .....	.2	2
Medical .....	.1	1
Total	11.6	100

Source: Market research conducted for the U.S. Department of Commerce, Bureau of International Commerce. Values based on Japanese trade estimates.

a significant role in the Japanese market. There were eight COM and 138 conventional micrographics service centers in Japan in 1971. In addition, about 150 small shops develop microfilm and provide other reprographic or photographic services. Many of the larger service centers sell micrographics and related equipment and provide other reprographic services.

Of the eight COM service centers, only one was started before 1971. The largest and apparently fastest growing COM service center is the Nissho Electronics Company, which offers computer related equipment and services. This company has three Stromberg Data-graphiX SD 4000 recorders and has sold several COM records to end-users. With 1970 sales totaling \$6 million, this company sells computer peripheral equipment (in addition to COM equipment and services).

The conventional processing service centers are scattered throughout Japan. Of these, 49 are located in the Kanto district, which includes Tokyo; 42 in the Kansai district, Osaka; 18 in Chubu (Nagoya); 18 in Chugoku and Kyushu (southern Japan); and 11 in the Tokoku (Hiroshima) and Hokkaido (northern Japan) districts. Only a few posted annual sales above \$300,000 in 1971.

Typical conventional processing service centers are: Reimeisha, Japan Microfilm Service, and Seishosha (all in Tokyo); Mita Blueprint and Japan Copy Center (Osaka); Suzuki Microfilm Laboratory (Kyoto); Sakura Shokai and Kansai Photo Industries (Kobe); Wakita Shokai and Nagoya Microfilm (Nagoya); Bunkado (Sendai); Toyo Microfilm (Fukuoka); and Asahi Blueprint Industries (Nagasaki).

Government agencies.—With at least 20 ministries, agencies, and institutes using micrographics equipment, the Japanese Government is a major customer. Microfilm equipment sales should increase to government agencies, especially to "paper-flooded" organizations such as the Welfare Ministry, the Patent Agency, and the Postal and Telecommunications Ministry. The government's share of the total micrographics market is expected to remain at about the 10% level, rising from \$1.2 million in 1972 to \$2.5 million in 1976.

Utilities.—Public utilities presently consume about 5% of the micrographics products sold in Japan and will be increasingly important users of micrographics. The Kokusai Denshin Denwa, (International Telephone and Telegraph), for example, presently uses a number

of readers and reader/printers to review documents microfilmed for it by a service center. In the future, this company plans to install a comprehensive microfilm system in conjunction with its facsimile and data processing systems. The Tokyo Gas Company has since 1960 used microfilm for engineering drawings, and the Tokyo Electric Power Company and Japan Telephone and Telegraph Company are considered good potential customers for micrographics equipment.

Universities and libraries.—There are 674 university libraries, 465 special libraries, 825 public libraries, and 36 branch libraries which are part of the National Diet Library System in Japan. Microfilm is used in 65 university libraries—and in other departments of some universities. At least 60 of the 465 special libraries use readers or reader/printers, and 28 have microfilm cameras. About 40 of the 825 public libraries have microfilm equipment. Libraries and universities, presently comprising about 4% of Japan's micrographics market, are expected to be growth markets for this equipment.

Legal Aspects

Notarized, microfilmed documents are admitted as evidence in Japanese courts, under conditions and restrictions spelled out in a standard established by the Japan Microphotography Association and approved by the Ministry of Justice. Japanese law stipulates, however, that all corporate accounting books and records, including vouchers, must be kept on file in their original form for 10 years. The business community, including such prestigious economic organizations as Keidanren (Federation of Economic Organizations), has been pressing for amendment of the Commercial Law to permit legal status for all microfilmed documents. Such an amendment has been before the Japanese Diet (Parliament) for several years, but no action has been taken. Ratification of the amendment undoubtedly would bring increased demand for micrographics systems and equipment. Japanese business leaders appear optimistic that this legislation will be enacted in the near future.

Competitive Environment

U.S. manufacturers supply virtually all micrographics products imported into Japan. The only "foreign" competition, about 1% of imports, has been from the United Kingdom, Germany, and Belgium and has consisted of cameras, reader/printers, and roll microfilm. The dominant position of the United States in Japan's micrographics import market appears secure. The United States over the next several years will certainly be the primary source of advanced, high capacity equipment. The import market for these products is expected to grow from \$3.3 million in 1972 to \$4.7 million in 1976.

However, Japanese manufacturers are expected to increase their own micrographics production, and imports could represent a declining percentage of Japan's future micrographics market unless the United States maintains its technical advantage. In 1968, micrographics systems were relatively new in Japan and imports supplied upward of 40% of requirements. In 1972,

consumption reached a level of \$11.6 million, of which Japanese firms provided an estimated \$8.5 million. Local producers are optimistic that by 1976 they will supply \$17.5 million in equipment and \$3.5 million in supplies (see table 4.)

In the judgment of many trade observers, the Japanese micrographics industry will require several years to bridge the technological gap between the United States and Japan. Japanese manufacturers produce a wide range of standard micrographics products, including some specially designed for the local market. One Japanese manufacturer plans to produce 40 COM units by 1976. No Japanese firms engage solely in the production of microfilm equipment, most of which is produced as a sideline by makers of optical or photographic products.

The principal Japanese manufacturers of micrographics products include the following:

Fuji Photo Film, the leading film and sensitized materials maker, with more than 70% of the market for ordinary film and more than 45% of the market for original microfilm. This company also has 50% to 55% of the hardware market, dominating domestic micrographics equipment production. *Fuji Photo Film* is well known as a general manufacturer of photographic equipment, but plans to diversify into the field of general information processing equipment, utilizing its outstanding film and optical technologies.

Konishiroku Photo, a pioneer in the photo and sensitized materials field. Most of the microfilm so far produced by this company is 16mm. and 35mm. roll film. It developed diazo film late in 1970 and 105mm. roll film for COM use early in 1971. This company is particularly interested in COM supplies and services.

Canon Camera, a leading Japanese camera maker which has successfully diversified into desk-top electronic computers, microfilm equipment, and special purpose optical equipment. Non-camera products presently account for nearly 50% of its total volume. Canon is second to *Fuji Photo Film* in the micrographics hardware field, with about 18% of local production, and is

Table 4.—Japan: Production of micrographics products, 1972 and projected 1976
(in thousands of U.S. dollars)

Equipment:	1972	1976
Cameras	3,600	8,400
Planetary cameras	1,800	—
Rotary cameras	900	—
Others	900	—
COM	140	1,550
Microfilm processors	650	1,520
Microfilm readers	430	980
Reader/printers	2,300	5,200
Other (peripheral items, duplicators, automatic retrieval devices)	155	255
Total	7,275	17,905
Supplies	1,500	3,600
Grand Total	8,775	21,505

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Japanese trade estimates.

the only Japanese manufacturer that has ventured into the COM equipment field.

To date, Japan has exported only a small portion of its domestic micrographics products (less than \$500,000 in exports, annually). Exports, mostly to Southeast Asian countries, have consisted of rotary cameras, readers, film, and miscellaneous supplies. Recently, however, Japanese micrographics manufacturers have attempted to enter European markets.

Direct foreign investment in the micrographics field is permissible under the Japan Foreign Investment Law of 1950, as amended. So far, no U. S. firm has established manufacturing subsidiaries in Japan nor have licensing arrangements been concluded between U. S. and Japanese producers. Some cooperative arrangements have been made, however, which could lead to more direct involvement by U. S. firms in micrographics production. For example, Canon Camera has a cooperative arrangement with Kalvar for development of equipment related to the usage of Kalvar film.

Current import duty rates are low, ranging from 3.75% to 7.5% (see table 5.) Japan fulfilled Kennedy Round commitments for a 50% reduction of rates by January 1, 1972. No other local taxes or charges are levied, and there are no quantitative or other import restrictions affecting these products. Import licenses are required but are routinely approved.

Sales Development

Imports are usually handled either by Japanese trading firms acting as distributors and representing their foreign principals as commission agents, or by specialized importers of office equipment and precision machinery. Thirteen Japanese companies and three sales subsidiaries act as importers for 24 U. S. micrographics products manufacturers. Locally-made products are usually sold through the manufacturer's distributors.

It is common practice for suppliers to guarantee maintenance and service for 1 year following delivery, after which a more specific contract is negotiated (generally approximating 5% of the original cost of the equipment). At the time of equipment delivery, it is customary to furnish temporary supplies of film and developing chemicals without charge.

Modern advertising media are available in Japan. Popular trade journals used by the micrographics industry include: *Nippon Keizai Shimbun* (Japan Economic Journal), *Nikkan Kogyo Shimbun* (Industrial Daily News); *Jimu to Keiei* (Office and Management); and *Micro Photography*, published by the Japan Microphotography Association.

Only certain high-value products, such as COM recorders, reader/printers and automatic processors, are leased, and lease periods usually run from 3 to 5 years. Manufacturers arrange for leasing through intermediary leasing companies.

A number of Japanese manufacturers and trading companies have set up business associations. U.S. firms report that these organizations are generally well-informed about requirements of their member companies and are helpful in providing advisory services. The following are representative of such Japanese organizations: Micrography Association, and the Japan Micro-

Table 5.—Japan: Customs duties for imports of micrographics equipment and supplies, effective January 1, 1972

Brussels Tariff		Basic rate (% ad valorem)
Nomenclature	Description	
90.07.....	Photographic cameras; photographic flashlight apparatus (Note: including COM)	3.75
90.10.....	Apparatus and equipment of a kind used in photographic or cinematographic laboratories, not falling within any other heading in this chapter, photocopying apparatus (contact type); schools or reels, for film; screens for projectors. (Note: including processors, duplicators, readers, and reader/printers)	5.0
84.53.....	Statistical machines of a kind operated in conjunction with punched cards; accounting machines operated in conjunction with similar punched cards; auxiliary machines for use with such machines. (Note: including automatic retrieval devices and miscellaneous microfilm equipment)	3.75
37.02.....	Film in rolls, sensitized, unexposed, perforated or not.	7.5
37.01.....	Photographic plates and film in the flat, sensitized unexposed, of any material other than paper, paperboard or cloth. (Note: including printout paper)	7.5
37.08.....	Chemical products and flashlight materials, of a kind and in a form suitable for use in photography.	5.0
48.21.....	Other articles of paper pulp, paper, paperboard of cellulose wadding. (Note: including aperture cards)	3.75

film Service Association, both at 3-16-4, Uchikanda, Chiyoda-Ku, Tokyo; the Kansai Microfilm Service Association, Akashi Building, 106 Shibata-cho, Kita-Ku, Osaka; and the Photo Sensitized Material Manufacturers Association, Fukuoka Building, Yaesu, Chuo-Ku, Tokyo.

A large number of trade shows and seminars are held in Japan and offer excellent opportunities for introducing new products and reaching potential buyers. Probably the most important is the "Microphotographic Systems" Exhibition and Seminar sponsored by the Kansai Microphotography Association, Akashi Bldg., 106 Shibata-cho, Kita-Ku, Tokyo. This specialized exhibition is held annually. The "Business Show," another important exhibit, is sponsored by the Japan Office Management Association 4-1-13 Sendagaya, Shibuta-Ku, Tokyo and is held every year in that city. There were 233 exhibitors at the 1971 exhibition, which attracted 516,000 visitors.

Information concerning participation in international exhibitions and congresses may be obtained from the Office of International Marketing, Bureau of International Commerce, Washington, D.C. 20230, or from any Department of Commerce field office.

Technical Standards

In Japan, use of the metric system of weights and measurements and the centigrade temperature scale is mandatory; therefore, all gages and measuring instruments should be calibrated accordingly.

Generally, Japan uses 100/200 volts, single and 3-phase, 2- and 3-wire, alternating current. The fre-

quency varies according to the geographic area; it is 50 hertz in the Kanto area, including Tokyo, the Tohoku and Hokkaido areas, and 60 hertz in the remainder of the country except for Kyushu, where both frequencies are available.

Microfilm size preference appears to be the same as in the United States. Initially, 35mm. was most often used, while 16mm. gradually came to be used extensively; 70mm. is seldom used. Today there is extensive use of microfiche. Silver halide is and will remain the film type preference for original photographic film. Diazo and thermo-vesicular films are being used increasingly for prints and duplication.

Japan employs the U. S. standard format of microfiche (4 x 6 inches, containing 60 document page images). Standards are set by Japan Industrial Standards (JIS). To date, only a limited number of standards have been issued by JIS for readers and microfilm reels, as well as for microfilming methods. For all practical purposes, Japanese standards are parallel to or compatible with U.S. standards.

Reduction ratios also are based upon U.S. standards, mainly as follows: for drawings, 15:1, 16:1, 22:1, 24:1, and 30:1, and for documents, 22:1 and 27:1.

A loan copy of basic research report "Micrographics-Japan," DIB 72-07-511, upon which this Export Market Digest is based, may be obtained from the Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C. 20230.

The Netherlands

The Netherlands, a small and highly industrialized country, has adopted microfilm for archival applications more extensively than most other countries, primarily because of the high cost of storage space.

The fast-growing Dutch economy is encouraging businessmen to adopt the modern techniques offered by the micrographics industry. Sales of micrographics products have advanced steadily in recent years, and a continuation of this trend is predicted.

American suppliers are in a particularly strong position to capitalize on the continued rapid growth expected in Dutch demand for micrographics products at least through 1976 (see figure 1).

U.S. firms already have a strong foothold in the market. The Dutch are expected to rely even more heavily on advanced U.S. micrographics systems over the next few years to help meet their ever increasing data processing needs.

Highlights

► Sales of micrographics equipment and supplies in the Netherlands, totaling \$4.5 million in 1972, are forecast to reach \$9 million in 1976.

► The Dutch rely almost exclusively on imports to meet the demand for micrographics products. Imports in 1971 totaled \$3.4 million, or 90% of the \$3.8 million micrographics market; U.S. firms supplied 54% or \$1.9 million worth of the imports.

► Cameras are in heavy demand in the Netherlands and the market in 1976 is expected to reach \$2 million, 2½ times the \$800,000 figure registered in 1972.

► Readers are the second most popular item; sales of readers in the Netherlands are forecast to double from \$600,000 in 1972 to \$1.2 million in 1976.

Brisk Growth Forecast

From 1968 to 1972, annual sales of micrographics equipment and supplies in the Netherlands rose from \$1.9 million to \$4.5 million (see table 1). Forecasts indicate that the market for micrographics products will reach \$8.7 million by 1976, representing an average annual growth rate of 18%.

Equipment in 1972 accounted for about 55% of the total micrographics market, or \$2.5 million, and supplies represented 45%, or \$2. million. In 1976, equipment sales are projected at \$5.4 million, or 62% of the market, and supplies at \$3.3 million, or 38%.

Imports, totaling \$4 million in 1972, accounted for 90% of the total Dutch micrographics market for that year. The 1972 figure was more than double the \$1.7 million registered in 1968. Equipment accounted for about 60% of total imports in 1972, or \$2.4 million, while supplies made up the remaining 40%, with \$1.6 million.

The future looks even brighter; imports in 1976 are expected to reach almost \$8 million, reflecting an average annual growth rate of about 18% in the period 1972-76. Equipment imports should amount to \$5.3 million in 1976, or 68% of the import market, while supplies should account for \$2.5 million, or 32%.

The United States has been the major supplier of micrographics products to the Netherlands, commanding at least 50% of the market since 1968 (see table 2). Purchases from the United States in 1971 accounted for 54% (over \$1.8 million) of total imports. Imports

from the United States should surpass the \$4 million mark in 1976. Germany and France together held about one-third of the import market in 1971; Germany supplied \$758,000, a 22% share, and France, \$483,000, a 14% share.

Specific Sales Opportunities

The Netherlands is expected to purchase almost \$33 million worth of micrographics equipment and supplies in the period 1972-76. U.S. firms will meet a substantial portion of this need. An extensive on-location market study recently conducted for the U.S. Department of Commerce reveals highly favorable prospects for the following micrographics products:

- 16mm. rotary cameras
- Medium-price readers
- Reader/printers
- Medium capacity, moderately priced, computer-output-microfilm (COM) devices
- Duplicators
- Low-price processors
- 16mm. silver halide film

Cameras.—Cameras, the largest segment of the Dutch micrographics equipment market, are expected to show greatest potential over the next 5 years. Camera sales, valued at \$800,000 in 1972, should more than double to \$2 million by 1976 (see table 3). Exceptional demand is forecast for 16mm. cameras, with sales mounting to \$1.9 million in 1976, up about \$1.2 million from 1972. Rotary cameras should account for the bulk of the 16mm. market. During this period, demand for 35mm. cameras will be modest.

Readers.—Readers are the second most popular item

with Dutch purchasers. Reader sales are expected to climb from \$600,000 in 1972 to \$1.2 million in 1976 and will account for almost 14% of the 1976 micrographics market. Local trade sources indicate that with the expected increase in the use of centralized information systems a strong demand is anticipated for moderately priced readers.

Computer-output-microfilm (COM) devices.— Although COM devices are relatively new to the Dutch (first introduced in 1971), this equipment already is becoming widely used. Purchases of COM recorders by the Netherlands in 1972 totaled \$400,000. Trade sources forecast that 1974 and 1975 will be big years for COM equipment. Annual COM sales are expected to reach about \$800,000 in each of these two years.

The Netherlands now has about six COM units; forecasts call for as many as 50 COM installations by 1976. Demand is expected to be strongest through 1976 for lower capacity, less expensive COM systems.

Reader/printers.— Many medium- and small-size Dutch firms are expected to move into micrographics utilization for the first time during the next few years. U.S. suppliers of reader/printers will find good sales potential among these newcomers to the marketplace. Sales of reader/printers are expected to reach \$800,000 by 1976, up dramatically from the 1972 level of \$300,000.

Duplicators.—With the Dutch turning more and more to active systems, the demand for duplicators is expected to grow rapidly during the next few years. Sales of duplicators are predicted to grow from an annual total of \$200,000 in 1972 to \$400,000 in 1976.

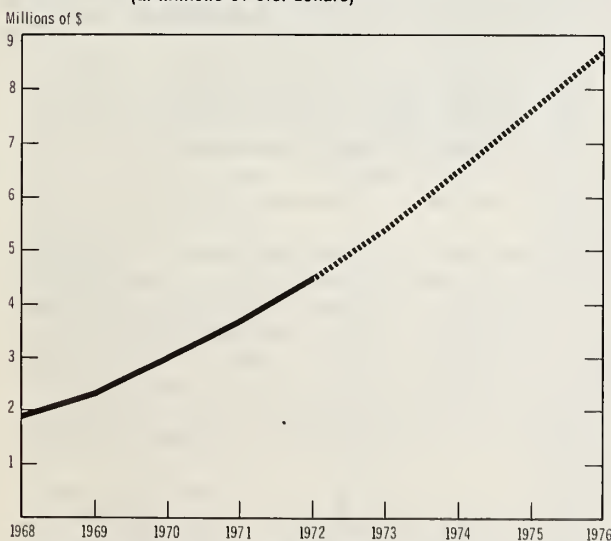
Processors.—Sales of processors in 1976 should increase to \$200,000, up fourfold over the 1972 level. Trade sources report that demand is strongest for low-cost processors.

Supplies.— Increased demand for micrographics equipment is complemented by the growing need for supplies. By 1976, the Dutch are expected to spend \$3.3 million per year for film, paper, and other micrographics supplies, representing a sharp rise over the 1972 level of \$2 million. U.S. manufacturing subsidiaries in Western Europe account for a substantial share of the total Dutch market for micrographics supplies. However, a significant quantity of supplies not manufactured abroad must be imported from the United States.

Silver halide film (16mm.) is by far the most popular item and accounts for 80% of the film purchases. Diazo film follows, with 15% of the market, while other types make up the remaining 5%. The expected rise in the sale of COM devices should spur a dramatic increase in demand for diazo film. Electrostatic paper sales should grow faster than photographic paper sales as electrostatic reader/printers replace obsolete devices based on paper technology.

Services.— Revenues generated by service centers stood at \$1.5 million in 1972 and should increase to \$2 million by 1976. Service centers are readily accessible in the Netherlands; their prices are low and their efficiency is high. Many organizations use them until they can afford an in-house installation. A new area of microfilm growth in the Netherlands that deserves attention in the 1970's is micropublishing. Sales of micropublishing services should total \$50,000 in 1973 and reach \$400,000 in 1976.

Figure 1. - The Netherlands: Size of market for micrographics equipment and supplies, 1968-72; and projected 1976
(in millions of U.S. dollars)



Note: Size of market equals production plus imports less exports.
Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on Dutch trade estimates and BIC analyses.

Table 1.—The Netherlands: Size of market for micrographics equipment and supplies, 1968-72, and projected 1976
(in thousands of U.S. dollars)

	1968	1969	1970	1971	1972	1976
Production	330	330	335	435	540	1,090
Imports	1,723	2,123	2,828	3,448	4,048	7,780
Exports	128	128	133	133	138	170
Size of market	1,925	2,325	3,050	3,750	4,450	8,700

Note: Size of market equals production plus imports less exports.

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on Dutch trade estimates and BIC analyses.

Banks Largest User Group

Microfilm technology has penetrated a broad spectrum of private and public entities in the Netherlands. Commercial enterprises, which now account for about half the country's total annual purchases of micrographics products, represent the sector offering greatest growth potential. Industrial firms rank second among the Netherlands' user sectors, accounting for nearly one-third of the market.

Also on the list of prime potential customers for the product category are national and municipal governments, laying claim to about 15% of the market. Other potentially profitable markets are medical and scientific institutions, libraries, and service centers, which together account for around 10% of the market.

Commercial.—Commercial enterprises, under heavy pressure to control their mounting information dissemination and storage problems, have turned to microfilm for the answer. They spent about \$2 million for micrographics equipment and supplies in 1972 (see table 4). Market analysts predict that if conditions remain favorable this figure could grow by as much as 35% in the next few years. Much of this growth could result from increased sales of COM devices.

Banks represent the single largest user group within the commercial sector. The country's two largest banks, both prime micrographics users, are the Amsterdam-Rotterdam Bank N.V., Amsterdam, and the Algemene Bank Nederland N.V., Amsterdam. These banks have an extensive network of several hundred local branches each.

The Dutch insurance industry constitutes another major growth sector of the micrographics market as a result of an expanding volume of daily transactions. Micrographics expenditures by insurance companies are expected to rise 30% annually during the next 5 years. Among the major Dutch insurance companies expected to step up their investments in micrographics equipment in efforts to improve their record handling and storage systems are N.V. Amev, Utrecht; Nationale Nederlanden N.V., The Hague; and Erste Nederlandshe Nillmij N.V., The Hague. Other insurance companies are expected to follow their lead. In addition to the use of microfilm for archival applications, the insurance industry is expected to make extensive use of micrographics equipment for active applications.

Industry.—Outlays for micrographics products by the industrial sector reached \$1.3 million in 1972. Based on a predicted 20% average annual growth rate, micrographics expenditures by this sector are projected to reach \$2.7 million in 1976. Besides engineering drawing

applications, microfilm systems are used by industrial companies for inactive filing, as well as for the recording and dissemination of active information.

Knowledgeable trade sources indicate that a number of industrial concerns now using service centers are on the verge of establishing their own micrographics installation. More and more firms are expected to introduce microfilming as uniform engineering drawing standards are adopted throughout industry. Dutch industrial firms are adopting the German DIN norms, and trade sources indicate that use of DIN standards should be commonplace throughout the Netherlands by 1980.

The leading microfilm-using industrial firms are N.V. Philips Gloeilampen Fabrieken, Eindhoven; and Verenigde Nederlandse Uitgeversbedrijven (VNU), Haarlem. Philips installed a COM system in 1970 (Kodak KOM 90) to microfilm customer invoices and to manage personnel records. Philips also operates a Kodak Miracode automatic retrieval system. The firm is also considering using the COM for microfilming accounting and inventory control records. This would require the purchase of a large number of readers because its plants, factories, and offices are located throughout the Netherlands.

VNU, the largest magazine publishing firm in the Netherlands, installed a COM-based microfilm system (Memorex 1603 on-line COM recorder) in 1972 to update subscribers' files. VNU is considering using the system to handle its accounting records; this would require the purchase of up to 50 additional readers.

Other leading Dutch industrial firms now using micrographics equipment are VMF Stork-Werkspoor, Amsterdam, a major producer of machinery, with 25,000 employees; Akzo, Arnhem, the major Dutch chemical concern; and KLM, Amsterdam, the national Dutch airline.

Industrial firms likely to adopt microfilm technology in the near future include Unilever; Heineken's, Amsterdam, the largest brewery in the Netherlands; Holec N.V., Hengelo, a heavy electrical equipment manufacturer; Hoogovens N.V., IJmuiden, a steel mill; and Doorne's Automobil Fabrieken, Eindhoven.

Government.—The government sector accounted for \$700,000, or 15% of the total micrographics market in 1972.

The Post Giro (PG), a part of the Dutch Post Telegraph and Telephone system, is a banking service with 3 million accounts, competing in some areas with the commercial banks. PG is a major user of micrographics equipment. Its facilities include 2 COM recorders (Ko-

Table 2.—The Netherlands: Value and market share of imports of micrographics equipment and supplies by country of origin, 1968-71

(in thousands of U.S. dollars)

	1968		1969		1970		1971	
	Value	Market share percent	Value	Market share percent	Value	Market share percent	Value	Market share percent
United States	862	50	1,168	55	1,414	50	1,862	54
Germany	431	25	467	22	566	20	758	22
France	258	15	276	13	424	15	483	14
Other	172	10	212	10	424	15	345	10
Total	1,723	100	2,123	100	2,828	100	3,448	100

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on Dutch trade estimates and BIC analyses.

dak KOM-90), 40 Kodak Reliant cameras, and 30 readers. The system is used primarily to record on microfilm several thousand customer account transactions daily.

The Amsterdam municipality operates its own Giro system, but this installation is significantly smaller (300,000 accounts) than that operated by the national postal system. Its installation includes three readers and four reader/printers. The two Giro installations together account for a major portion of government expenditures to date for micrographics equipment.

The trend toward streamlining information processing is gathering strength in the government sector. Two departments in particular, the Ministry of Finance and the Social Security Administration, beset by paperwork overload, could become significant micrographics customers in the near future. A growth rate of 15 to 25% per year is projected for government micrographics expenditures.

Scientific.—Three Dutch organizations have adopted micrographics techniques to disseminate scientific information. The largest is the Microfiche Foundation, part of the Delft Technical University, which specializes in the dissemination of technical documentation. Another company, Mink, in Leiden, provides microfiche

copies of technical articles published in professional journals all over the world. Excerpta Medica, in Amsterdam, offers similar services to the medical profession, providing doctors with the latest medical information on microfilm.

Medicine.—Hospitals in the Netherlands are showing increasing interest in micrographics equipment and should constitute a promising growth market. Two hospitals, Vrij Universiteit Zieken Huis in Amsterdam and Konigin Juliana Zieken Huis in Hengelo, are microfilming patient medical records. With hospital operating costs rising, administrators are becoming increasingly aware of the savings to be realized by the adoption of micrographics technology.

Libraries.—The Netherlands has about 3,500 public libraries, representing a vast untapped market for micrographics products. Libraries use or intend to use micrographics equipment to streamline booklending operations and to record on microfilm professional articles and rare books. Hardware products with the greatest sales appeal to Dutch libraries are moderately priced cameras, readers, and reader/printers.

Service centers.—Business among service centers is expected to grow by as much as 20% annually during the next several years.

Between 15 and 18 microfilm service centers operate in the Netherlands. The only center offering COM services is operated by Kodak in Rijswijk. Other major service centers include Mikroff Nederland N.V., in Nijmegen and Wassenaar; Armrend N.V., Utrecht; Aspa-Mikro N.V., Utrecht; and Mullens N.V., The Hague. These centers are primarily involved with engineering drawing and archival work.

Table 3.—The Netherlands: Sales of micrographics products by principal subcategories, 1972 and projected 1976

(in thousands of U.S. dollars)

	1972	1976
<i>Micrographics equipment</i>		
Cameras	800	2,000
Readers	600	1,200
Computer-output-microfilm (COM) devices	400	700
Reader/printers	300	800
Duplicators	200	400
Processors	50	200
Other equipment	100	100
Total	2,450	5,400
<i>Micrographics supplies</i>	2,000	3,300
Grand total	4,450	8,700

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on Dutch trade estimates and BIC analyses.

Legal Aspects of Microfilm

Microfilm documentation has no legal status in the Netherlands. A court may or may not accept microfilm as legal evidence. However, the absence of firm legal status has not seriously inhibited the use of microfilm. Dutch concerns frequently consider it worth the risk of possible adverse court decisions in order to save storage costs of traditional archives. Although many Dutch companies have disposed of original documents after recording them on microfilm, none has reported a lost court case due to unavailability of originals.

Competitive Environment

Imports of micrographics equipment and supplies from the United States represented about 54% of total Dutch consumption in 1971. Except for a very small quantity of microfilm cameras, processors, and peripheral items, there is very little production of micrographics equipment in the Netherlands. Dutch micrographics exports in 1972 amounted to only \$138,000. The major competition in the market comes from Germany and France—Germany with a 22% share of imports and France with a 14% share.

Several factors contribute to the demand for U.S. products in the Dutch micrographics equipment market. The Dutch recognize the excellent quality and advanced development of U.S. micrographics products. They prefer equipment which has been tried and proven in the marketplace. They also find the application of assistance and maintenance services provided by U.S. firms of high caliber.

Three major U.S. micrographics manufacturers hold large shares of the Dutch micrographics equipment and supplies market. These are Kodak, Bell & Howell, and 3M. Kodak and 3M sell through their wholly owned Dutch subsidiaries. Aspa Mikro has been Bell & Howell's exclusive agent for the Netherlands. This firm is part of the Aspa Group, manufacturers of office equipment in the Netherlands.

The Netherlands is a member of the European Economic Community (EEC), the Benelux Economic Union (Belgium, the Netherlands, and Luxembourg), and the General Agreement on Tariffs and Trade (GATT). The EEC Customs Union became effective on July 1, 1968: goods were then permitted to move duty-free from one member country to another. At the same time, imports into all EEC countries from non-EEC sources, except for associated countries and countries with special agreements, were subject to the EEC Common External Tariff (EXT) rates of duty (see table 5). All goods in the Netherlands, both domestic and imported, are subject to the value-added (TVA) tax. The TVA for imported goods is assessed on the cost, insurance, and freight (c.i.f.) duty-paid value (16% on equipment and supplies).

Table 4.—The Netherlands: Value and market share of micrographics consumption by principal user sectors, 1972 (in millions of U.S. dollars)

Sector	1972	Percent
Commercial	2.0	45
Industry	1.3	30
Government	0.7	15
Other	0.5	10
Total	4.5	100

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on Dutch trade estimates and BIC analyses.

Sales Development

More than 80% of Dutch micrographics business is conducted in the Amsterdam-Rotterdam-Eindhoven triangle. Practically all equipment is old outright rather than leased. However, leasing promises to grow in popularity in the COM segment of the market.

Standard terms of sale for equipment usually include a 20% down payment with the order, the balance to be paid 30 or 60 days after delivery. Large customers and government agencies often receive quantity discounts and longer payment terms. Pricing practices on locally produced micrographics products involve mark-ups of from 20 to 25% and on imported products from 15 to 25%.

The usual equipment warranty is 1 year for parts and labor, provided the equipment has been used according to manufacturers' recommendations. Maintenance and service costs are normally covered by a separate yearly contract. The contract charges during the first year are typically 2% or less of the value of the equipment installed.

The most effective route to successful micrographics equipment sales in the Netherlands is the satisfied customer. For example, the popular Postal Giro micrographics system, with its two COM units, has attracted the attention of many bankers and industrialists. The system adopted provides a service that permits an account holder to transmit money to any other account holder without using checks.

Table 5.—The Netherlands: Common external tariff rates on micrographics equipment and supplies

Brussels Nomenclature	Description	Rates applicable to imports from outside the EEC and from the U.S. (percent ad valorem)
9007	Special photographic equipment for photocopying documents, for the preparation of negatives, for printing cylinders (all micrographics equipment except COM readers, reader/printers, and recorders)	13.0
9009	Fixed projection equipment used to enlarge or reduce photocopies (readers and reader/printers are included)	10.5
3702	Sensitized film in reels or strips nonperforated	12.8
8453	Automatic information processing equipment and peripherals (COM readers included)	7.0

Source: U.S. Department of Commerce, Bureau of International Commerce market research study.

Technical Standards

Throughout most of the Netherlands electric power is 220 volts, single-phase, 50 hertz. In some areas, 380-volt, 3-phase, 50 hertz power is used. All equipment plugs must have a ground.

The metric system is used in the Netherlands and all equipment should be calibrated in the metric system.

Silver halide film is preferred for original microfilming and diazo films are used almost exclusively for duplication purposes. Vesicular films of the "Kalvar" type are used only for very limited and special applications because of their high price. Administrative/management applications are dominated by 16mm. film and engineering drawing reproductions by 35mm.

The Dutch have adopted the U.S. standardized microfiche size and formats. In the Netherlands, the standard 105mm. x 148mm. microfiche usually contains 60 document page images. The standard reduction ratio for letter-size or legal-size documents is 1:24; for large engineering drawings it is 1:30; and for smaller drawings reduction ratios of 1:21 and 1:15 are common.

A loan copy of basic research report "Micrographics—Netherlands," DIB 73-03-509, upon which this Export Market Digest is based, may be obtained from the Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

Spain

The economy of Spain is one of the fastest-growing in Europe, and efforts to modernize business policies and practices are conducive to increased sales of micrographics equipment and supplies. The Federal Government is even offering incentives to businessmen who streamline their enterprises. These activities are spurring increased sales of micrographics equipment and supplies, which have doubled since 1968 and should more than triple over the 5-year span from 1971 to 1976. No micrographic products are produced

in Spain. Demand is filled largely by American firms, which are expected to hold their overwhelming advantage in the years ahead because they are recognized as leaders in micrographics technology and have won confidence by analyzing Spanish information-handling needs and training their personnel in micrographics technology along with the recent devaluation of the dollar, make U.S. micrographics equipment less expensive to Spanish buyers, and should spur increased sales of U.S. micrographics equipment.

Highlights

► Spain's drive to modernize commerce and industry should help generate a 5-year increase in sales of micrographics equipment and supplies averaging 30% annually. Sales should rise from \$1.2 million in 1971 to \$4.7 million by 1976.

► Imports are expected to continue to supply all of the country's needs for micrographics equipment in the predictable future.

► U.S. firms should continue to supply 75% of the market.

► Best sales prospects are to be found in banking and in governmental agencies. Industrial firms also offer a promising market. These three sectors presently account for about 85% of total micrographics sales in Spain.

► The first computer-output-microfilm (COM) system was installed in a Spanish bank in 1970 and COM sales are expected to increase rapidly through 1976.

Spanish Interest in Micrographics Is Growing

The micrographics market in Spain is expanding rapidly, having doubled from \$600,000 in 1968 to \$1.2 million in 1971. This rapid growth is expected to continue, with sales of about \$4.7 million predicted for 1976. (See chart 1.)

In 1971, \$1 million worth of micrographics equipment and \$200,000 worth of microfilm and other supplies were sold. Sales of micrographics services through centers or bureaus totaled another \$350,000.

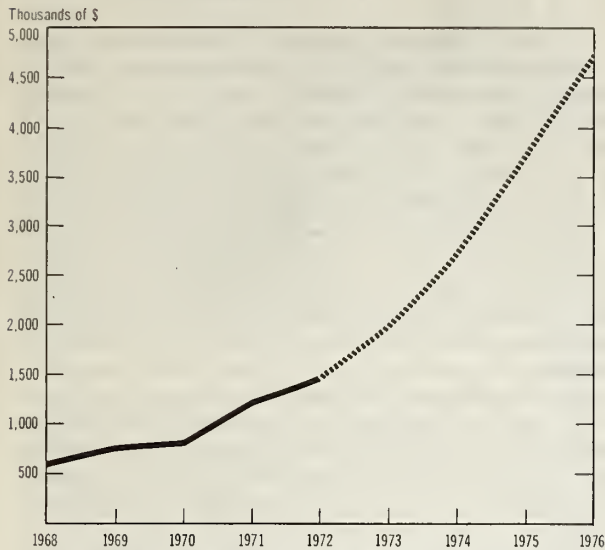
U.S. firms supply 75% of Spanish micrographics imports. The remaining 25% is supplied almost entirely by France, the United Kingdom, and West Germany. Japanese micrographics manufacturers did not enter the market until 1972. (See table 2.) Actually, the total sales of micrographics produced by U.S. firms and subsidiaries may reach 90% or more (including products manufactured in Europe by subsidiaries of U.S. firms).

Specific Sales Opportunities

An extensive market survey recently conducted in Spain for the U.S. Department of Commerce shows that the following micrographics products have the highest potential for sales:

- 16mm. readers
- 16mm. cameras

Figure 1. - Spain: Micrographics equipment and supplies market, 1968-72; and projected 1973-76
[in thousands of U.S. dollars]



Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Spanish trade estimates and survey of Spanish end-users.

- Small-capacity on-line and off-line COM devices
- 16mm. electrostatic reader/printers.
- Silver halide film

Readers.—Sales potential is basically higher for readers than for any other type of micrographics equipment. Sales of readers may reach \$1.1 million in 1976, up from only \$170,000 in 1971. (See table 1.) Several large banks and insurance companies will be procuring micrographics equipment, including a large quantity of readers, within the next 3 years. Greatest interest has been expressed for a medium-price reader with acceptable image quality, rather than the premium quality readers now being offered by several U.S. firms.

Computer-Output-Microfilm (COM) Devices.—Although Spain has only one COM installation at present, there are about a dozen likely customers, mainly banks, which have plans to install COM devices by 1976. Recent sharp wage increases (up 13% in 1971), are convincing larger firms of the need for more efficient administrative procedures. Low-cost, small-capacity equipment, both on-line and off-line, is particularly attractive to Spanish buyers.

Cameras.—Total camera sales are expected to increase more than twofold, from \$380,000 in 1971 to \$850,000 in 1976 (an average rate of about 17% per year), with most of the growth in sales of 16mm. cameras. Presently, most 16mm. cameras sold in Spain are of the more sophisticated types and are supplied mainly by a single U.S. manufacturer. Future demand should be heaviest for the less sophisticated, more moderately priced lines. Banks, insurance companies, industrial and government users might spend as much as \$770,000 for 16mm. cameras in 1976, compared with \$300,000 in 1971.

The market for 35mm. cameras, principally those used for reproduction of large engineering drawings, should remain at an average level of \$80,000 per year for the next 5 years. Many Spanish manufacturers receive technical drawings on microfilm from foreign licensors, a practice which limits the need somewhat to purchase their own 35mm. cameras. One U.S. firm supplies most of the 35mm. cameras sold in Spain, with a German manufacturer holding second place. Service bureaus reproduce engineering drawings for many manufacturers, and only the larger Spanish manufacturers have their own 35mm. microfilm cameras.

The market for microfilm step-and-repeat cameras is negligible and is not expected to develop substantially through 1976.

Reader/Printers.—Because of the demonstrated Spanish fondness for hard copies and the abundant supply of clerks to handle them, the ratio of reader/printers to total micrographics equipment and supplies is one of the highest in Europe. Attractive sales opportunities exist for electrostatic reader/printers, which are displacing other types because of their speed and ease of operation. Reader/printer sales should increase from \$170,000 in 1971 to \$500,000 in 1976.

Processors.—At present, this market is small and "captive," as most users buy the processor recommended by the manufacturer of the cameras they purchase. Annual sales should reach \$130,000 in 1976.

Duplicators.—The expected surge in sales of COM recorders is likely to cause duplicator sales, currently small, to reach \$100,000 by 1976.

Automatic Retrieval Devices.—A market for automatic retrieval devices has not yet developed. Greatly reduced prices and improved simplicity of operation would be necessary before automatic retrieval devices become popular in the Spanish marketplace. An increase in the number of firms large enough to utilize such devices effectively may occur as Spain's economy moves ahead.

Supplies.—Although sales of film and photographic paper totaled only \$200,000 in Spain in 1971, these sales are expected to accelerate to \$1.3 million by 1976. Formerly most supplies were used for 16mm. filing systems and archives or for engineering drawings. However, rapid market growth, including increased utilization of dynamic information dissemination systems, is expected to account for a projected sixfold increase in sales of film and paper. At present, silver halide film accounts for 90% of sales, with diazo film accounting for another 5% of sales. The diazo market should double annually, supported by increased COM usage.

In the future, electrostatic paper sales should increase faster than photographic paper sales. Three large manufacturers dominate the market for microfilm supplies.

Services.—The market for micrographics services will rise sharply by 1976. Revenues generated by service centers in 1971 amounted to \$350,000. In 1976, sales by service centers should reach \$1.6 million, of which \$900,000 may be from conventional services, \$250,000 for COM service, and \$450,000 for micro-publishing.

It is possible that two COM service bureaus will

Table 1.—Spain: Sales of microfilm products by principal subcategories, 1968, 1971, and projected for 1976
(in thousands of U.S. dollars)

	1968	1971	1976
Cameras	280	380	850
Readers	60	170	1,100
Reader/printers	100	170	500
Computer-output-microfilm (COM) devices	—	140	550
Peripheral items	50	100	170
Duplicators	—	—	100
Processors	—	40	130
Total	490	1,000	3,400
Micrographics supplies	110	200	1,300
Grand total	600	1,200	4,700

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Spanish trade estimates.

open for business within the next 2 or 3 years. They may face tough competition from banks and insurance companies which, having installed their own COM systems, could be in a position to sell extra COM time at minimal cost.

Increased Demand for Micrographics Evidenced

As in many European countries, banks and the government are the most prominent users of micrographics in Spain. Banks now account for 48% of the country's total micrographics purchases, and they will buy considerable amounts of micrographics equipment for the next few years. The government accounts for 20% of micrographics sales. Service bureaus, major public transportation agencies, and the national soccer pool (together comprising 15% of the market) all plan to increase existing micrographics facilities.

Industrial firms, which are being encouraged by government to consolidate and modernize, represent a potential growth market for micrographics. Currently, automotive manufacturers and steel mills account for 15% of total sales of micrographics equipment and supplies in Spain. The insurance industry is responsible for only 2% of present sales but promises to become a

major micrographics customer as more firms emulate the one insurance company now using microfilm equipment. The Spanish micrographics market is concentrated in or near the capital city of Madrid and the industrial city of Barcelona.

Commercial banking, together with insurance, is estimated to account for 4% of the gross national product (GNP). The banking sector has grown at an average rate of 18% a year for the past 3 years and is projected to expand at a rate of 12% during the next few years. Six large commercial banks handle about two-thirds of the private sector's banking needs. These are the Banco Espanol de Credito (BANESTO), Banco Central, Banco Hispano Americano, Banco de Bilbao, Banco de Vizcaya, and Banco de Santander. All have headquarters or offices in Madrid except the Banco de Santander, which has its head office in the suburb of Barajas.

Bank transactions are microfilmed for storage purposes, and the originals are sent to storage depots outside Madrid because the law requires that they be kept for 5 to 10 years, depending on the document. Fortunately, such storage is neither expensive nor scarce.

One bank, the Banco de Santander, which has 256 branches, has recently bought a Kodak KOM 90 microfilmer (computer-output-recording unit) and is using it for daily, weekly, and monthly statements. It plans to switch from roll film to microfiche. The bank has not yet undertaken the daily processing of data to its branches, mainly because an on-line teleprocessing network, linking 27 branches in Madrid and 37 branches in Barcelona, is planned to be in operation by the end of 1973. In addition to a COM microfilmer, the Banco de Santander has four readers, one developer, and three cameras at its main office.

It is believed that the other five leading banks in Spain soon will follow the example of the Banco de Santander and buy COM systems. Their interest appears to be directed toward low-cost on-line systems.

Of Spain's 266 insurance companies, 60 firms control 99% of the business. The insurance industry is becoming more prominent in Spain, with demand, particularly for auto insurance, accelerating. Only one insurance firm is known to be using microfilm, accounting for 2% of Spanish micrographics equipment sales. Insurance firms offer a large untapped market for micrographics.

Table 2.—Spain: Value and market share of imports of micrographics equipment and supplies by country of origin, 1968-71
(in thousands of U.S. dollars)

	1968		1969		1970		1971	
	Value	Market share percent	Value	Market share percent	Value	Market share percent	Value	Market share percent
United States	430	72	550	73	575	72	900	75
France	75	12	100	13	120	15	160	13
United Kingdom	40	7	50	7	40	5	70	6
Others	55	9	50	7	65	8	70	6
Total	600	100	750	100	800	100	1,200	100

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Spanish trade estimates.

The leading auto insurer, MAPFRE (Mutualidad de Seguros, located at Avenida de Calvo Sotelo, 25 Madrid-4), is using 16mm. microfilm equipment (one camera, one tabulator, 37 readers, and four reader/printers). This company also is considering the acquisition of a COM recorder and related equipment to enable transmission of information on microfiche to its 50 branches. Other insurance firms are feeling pressure of rising administrative costs caused by inflation. These developments should prompt insurance companies to adopt more efficient methods, including the use of microfilm for their working files. Legally, however, they still are required to store original documents.

Industry.—Spain's industry accounts for about 36% of the GNP and 37% of the labor force. As the most dynamic sector of the economy, Spanish industry offers growth sales potential to microfilm equipment manufacturers. The automotive and steel industries presently are the largest users of microfilm equipment in Spain, but COM equipment is not yet being used.

The motor vehicle industry turned out 453,000 passenger cars in 1971, and the Government's Third Development Plan forecasts an average growth rate of 11.5% a year in passenger car production during the early 1970's. Production and sales of cars are dominated by SEAT (Sociedad Espanola de Automoviles de Turismo, S.A.). This firm was created in 1950 by the Spanish Government's holding company, INI (Instituto Nacional de Industria) and makes cars under license from FIAT of Italy. SEAT's plant is in Barcelona, but the head office is at Avenida del Generalísimo 146 in Madrid. At present, SEAT uses no microfilm, and technical drawings are received from FIAT in regular form. SEAT is interested in a 35mm. system to microfilm technical drawings, and they also have been considering a system for microfilming their administrative archives.

ENASA, also controlled by INI, and better known by its truck brand PEGASOS, is Spain's largest truck manufacturer. ENASA also makes marine and locomotive engines. Its headquarters are at Avenida Aragon 402 in Madrid. Since October 1971 this firm has had identical 35mm. installations in its plants in Madrid and Barcelona for microfilming technical drawings. Each system consists of a 35mm. camera, four readers, one duplicator, and one enlarger/printer. A similar system will be needed within the next year or two for ENASA's third plant at Valladolid, an industrial center not far from Madrid. ENASA also is considering a 16mm. system for billings and correspondence.

Chrysler Espana (Barreiros, S.A.) manufactures Simca and Dodge Dart automobiles as well as trucks. It is Spain's second largest car manufacturer, having its main plant at Villaverde, near Madrid. This company is not yet using micrographics equipment. Other important motor vehicle manufacturers are Motor Iberica, S.A. in Barcelona, producing trucks and tractors under license from Massey-Ferguson, Ltd., of Canada; Fabricacion de Automoviles, S.A. (FASA), in Valladolid, making cars under license from Renault of France; and Citroen Hispana, S.A.,

The steel industry produced more than eight million tons in 1971, which was double its output of 5 years earlier. It has not, however, been able to catch up with rapidly rising domestic demand. Because the govern-

ment wishes to reduce dependence on imported steel, production in Spain is expected to increase by about 14% to 15% per annum over the next 5 years. Three firms dominate the steel industry in Spain. They are ENSIDESA (Empresa Nacional Siderurgica, S.A.); AHV (Altos Hornos de Vizcaya, S.A.); and UNINSA (Union de Siderurgicas Asturianas, S.A.). ENSIDESA and UNINSA are both controlled by the government holding company, INI (Instituto Nacional de Industria), and they are in the process of merging with official encouragement.

AHV, a company in which United States Steel has a 25% interest, has just entered into what may be the largest privately financed project in Spain's history—Altos Hornos del Mediterraneo—a joint venture of AHV with Spanish banks and savings companies and a 15% participation by U.S. Steel. The latter will build a six-million-ton capacity steel mill complex over the next 13 years.

ENSIDESA is well pleased with its successful use of micrographics. It has microfilmed 700,000 technical drawings with a 35mm. system purchased a year and a half ago. It also uses a 16mm. installation to register and classify incoming and outgoing mail. It plans to acquire three or four electrostatic reader/printers when the ENSIDESA-UNINSA is complete. The combined facilities are likely to purchase additional microfilm equipment similar to that being used by ENSIDESA.

Government. — Purchases of micrographics equipment, supplies, and services by agencies of the Spanish Government account for approximately 20% of the market. Most of the Ministries (Ministries are the equivalent of U.S. Departments) are potential buyers. The contact point in each is the Technical Director General (Director Tecnico General).

So far, micrographics are used in the government mostly for filing purposes and for archives. The Ministry of Foreign Affairs, for example, has been microfilming its most important documents for 15 years and recently bought additional equipment to handle its files of newspaper clippings gathered from all over the world. The ministry uses two American-made 35mm. cameras, two American 16mm. cameras, one German camera, and several American-made readers and reader/printers.

The Patent Office (Oficina de Patentes) uses 35mm. machines for copying its oldest patents on roll films, but it still stores the originals. The Patent Office uses three Kodak MRD 2E 35mm. cameras, two Kodak PE 1A reader/printers, one Prostar processor, and one Rank Xerox 1824 printer. Any document less than 10 years old is kept on paper only, but eventually all patents will be recorded on aperture cards.

The Inspeccion Mutualidades Laborales, the Section of the Ministry of Labor which is responsible for Spain's Social Security program, recently purchased a 16mm. microfilm system and plans the purchase of about 100 readers for its eight regional offices.

The Government of Spain in February 1971 contracted with a service bureau to publish the *Boletin Oficial de Estado* on 16mm. roll films. All official documents are published in full in the *Boletin*, which appears daily in newspaper format as well as on microfilm. Since 1950, the Ministry of Education's Servicio Na-

cional de Microfilm has been microfilming historical and religious archives, and in early 1972 it began micro-publishing a historical series mainly for sale to university markets, including those in the United States.

Public Transportation. — Three government-owned transportation enterprises are interested in buying micrographics equipment. Two of them, Iberia Airlines and RENFE, the railroad, already use microfilm for technical manuals and drawings. Iberia has 33 readers, 17 reader/printers, and a duplicator, which are used to duplicate and disseminate technical data received from the United States in microfilm form. With their traffic increasing by about 25% per year, Iberia plans to use microfilm to register correspondence and to facilitate distribution of service bulletins. RENFE, which has a planetary camera, three readers, a processor, and a printer, is considering buying more 16mm. equipment and may begin to utilize jackets. The Madrid subway (Metro de Madrid) does not use microfilm at present but is about to purchase a 35mm system to handle its growing files of technical drawings, which are received on paper from more than 400 different suppliers of subway equipment and spare parts. These drawings will be microfilmed and put on aperture cards.

Research and Development.—Spain's level of expenditures on scientific research, at 0.2% of the GNP, is well below the 1% spent by most European nations. The Government's Second and Third Development Plans call for an increase in spending on research and development, particularly on projects involving quality control and automation which could help reduce the dependence of the industrial sector on foreign technology. Research centers will be potential customers for micrographics equipment, even though their present consumption is negligible.

Service Centers.—There are nine service centers in Spain. Their revenues totaled \$350,000 in 1971 and may reach \$1.6 million in 1976, derived mostly from conventional microfilm conversion services. It is likely that one or two more will be established within the next year. The largest service center is Kodak's in Madrid. Kodak has a second center in Barcelona. CINECO, a sales agent for Bell & Howell and Pertec, operates the nation's second largest service bureau located in Barcelona. The third largest, CEMIRSA, at Fernandez de la Hoz 28, in Madrid, is considering the acquisition of COM equipment in 1973. The Centro Tratamiento Documentación at Hermanos Miralles 78 in Madrid, the Estudio Tratamiento Documentación at Tamarit 104 in Barcelona, Microdoc in the port city of Bilbao, and Microfilm Espanol, S.A. in Madrid are other smaller service centers. There is a possibility that a COM service center might be established by a group which includes Stromberg DatagraphiX, SISCO (a French-based COM service bureau), and a Spanish insurance company. CEMIRSA is also considering offering COM services.

Micropublishing.—The only micropublisher in Spain is the Servicio Nacional de Microfilm, Serrano 115, in Madrid, started in 1950 under the auspices of the Ministry of Education. Its purpose was to microfilm valuable historical and religious archives, mainly books. When that project was finished in 1971, the Service

began publishing materials relating to the history of Spain and Latin America. These publications found a ready outlet in the American university market. Sales are expected to reach \$80,000 in 1973. By June 1972, the Service had a catalog listing 19 services available on roll films, 10 series on microfiche, and 17 historical map series prepared on 35mm. aperture cards. The equipment used includes two Kodak MRD 2E cameras, one Bell & Howell Dataflash camera, one Dagmar microfiche camera, one Ozalid diazo duplicator, one Ozakop Kalle duplicator, one N.B. jacket microfiche duplicator, one Kodak Prostar processor, one Bell & Howell Microdata processor, two Recordak automatic readers, one 3M reader/printer, one Microbox aperture card reader, and two Geneva readers. It appears the Servicio Nacional de Microfilm may have the micro-publishing field to itself for the foreseeable future.

Education. — Spanish educational institutions have just started to use micrographics. Of Spain's 16 universities, only the University of Madrid and the University of Barcelona have microfilm equipment. They have a few microfilm readers which enable them to read films received from abroad. Spanish universities and colleges are currently short of funds, which affects their capability to acquire microfilm equipment. As their fiscal condition improves, the educational market for micrographics is expected to increase in size.

Libraries.—Libraries are administered by the Director General of Archives, which depends on the Ministry of Education for its financing. Spain has relatively few public libraries. The Biblioteca Nacional (National Library), located at Avenida Calvo Sotelo 20 in Madrid, is the only library with microfilm equipment. The library and its eight provincial branch libraries have a few readers for use with materials received from other countries. Libraries, like the schools and universities, have little funds at present for micrographics.

Medical.—Hospitals in Spain, also short of funds, are conservative in regard to administrative expenditures, including those for micrographics technology. One institution, however, the Clinica Lopez Ibor (Avenida Nueva Zelanda 46, Madrid) has contracted with a service center to microfilm its files.

Other Users.—Spaniards are devoted soccer fans. A measure of their enthusiasm for the game (which they call "football") is the fact that the Patronado Apuestas Mutuas, which runs the weekly football pool, is the largest single user of micrographics in Spain. Seventy specially adapted Crowfield cameras microfilm six to eight million football pool slips every Saturday afternoon. When a winner appears to claim his prize, the paper slip he presents is compared with the microfilm copy to insure that no changes were made in the bet after the deadline. Patronado Apuestas Mutuas, which uses 10,000 rolls of 65-meter film each year, conducts open bidding for its film requirements.

In addition to the Crowfield cameras, Patronado Apuestas Mutuas uses 12 Kodak processors and 18 Kodak readers. Four Kodak Reliants are used for its administrative files. The number of persons participating in the pools is expected to reach 10 to 11 million each Saturday by 1976; accordingly, the Foundation

plans to acquire a 16mm. dynamic system which can coordinate the accounts of the 12,000 sales outlets.

Legal Aspects of Microfilm

Microfilm documentation is not accepted as legal evidence in Spain. Originals of most commercial documents must be kept from 5 to 10 years. A successful effort by a planned micrographics trade association to change this policy could mean increased sales of several percent per year, but most growth in micrographics sales will come from administrative uses, not from the use of microfilmed documents for legal evidence.

Competitive Environment

All micrographics equipment and supplies used in Spain are imported. There is no domestic production, and none is likely for the foreseeable future. American exporters have the major share (75%) of the market. France has approximately 13%, but its share may increase by a few percentage points, mainly in the area of supplies. The United Kingdom has about 6%, and West Germany holds most of the remaining 6% of this market. Japan has just entered the market but is not expected to be a significant competitor in the near future.

Only about a dozen firms account for almost all of the micrographics sales made in Spain. Four U.S. manufacturers have their own sales subsidiaries in Spain, and three others are represented by agents. West German manufacturers are successfully marketing 35mm. planetary cameras and some film, and a British firm markets a printer/enlarger. A Japanese company offers an automatic camera, roll films, a cassette reader, and a roll duplicator.

Some of the imports from West Germany, France, and the United Kingdom are products manufactured by American companies in their West German, French, or British plants. Eventually, sales of simpler cameras and readers and of paper and films manufactured by U.S. firms in Europe may become more significant. Supplies, in particular, will benefit from declining import duties between members of the European Economic Community (EEC). U.S. exporters, however, will continue to sell most of the advanced microfilm equipment, supplies, and services to Spain.

Import Duties

Spain, although not a member of the EEC, has preferential status, and an agreement signed in 1970 calls for gradual mutual tariff reductions between Spain and other EEC countries over the period 1970-77. Customs duties for micrographics products are listed in table 3.

Another tax, the "Impuesto de Compensacion de Gravamenes Interiores" (ICGI), is assessed on the c.i.f. (cost, insurance and freight) price plus customs duties. In addition to these import tariffs, due when the shipment clears customs, the usual sales, excise, and stamp taxes on manufactured goods also must be paid, with the rate being 12% on films and 10% on the other products listed in the previous table.

All imports are subject to controls of the Spanish Foreign Exchange Institute. Import licenses normally are not required for micrographics products. The "import declarations" required for statistical and foreign exchange purposes usually are approved without difficulty, although they can be suspended when "artificial" prices (e.g., dumping) are suspected.

Detailed information on Spain's foreign trade regulations is available in the U.S. Department of Commerce publication, "Foreign Trade Regulations of Spain," OBR 72-024, dated July 1972.

Sales Development

Three of the leading micrographics distributors in Spain (Kodak, 3M, and Agfa-Gevaert) are subsidiaries of parent companies. Bell & Howell is represented by an agent (CINECO, S.A.), which also represents three other manufacturers in the micrographics field. The leading distributors have demonstration showrooms and a sales force in the major Spanish cities, in addition to head offices in Madrid. Although many potential buyers are located in the industrial city of Barcelona or the port city of Bilbao, most sales presently are made in the city of Madrid. As sales rise, branch offices may be required in Barcelona, Bilbao, and Seville.

In Spain, demonstration of the equipment's specific applicability to the potential customer's business or administrative needs is important. It is also important that brochures and other key materials be prepared in the Spanish language. Sellers rely on

Table 3.—Spain: Customs duties on micrographics items

	Percent Tariff on Imports from EEC Countries in 1972	Percent Tariff on Imports from Outside EEC in 1972	Percent Tariff on EEC Imports in 1977
Reader/printers, enlargers	36.5	34.7	27.4
Duplicators and processors	31.5	29.9	23.6
Micrographics films	50.0	44.6	35.2
Micrographics duplicating films	25.0	4.7	3.7
Cameras and other microfilm equipment	20.0	19.0	15.0*
Microfilm readers—no duty	0.0	0.0	0.0

* With a minimum of 285 pesetas (currently U.S. \$4.07) and a maximum of 21,750 pesetas (currently U.S. \$310.71) per unit.

personal calls made on prospective customers by members of a trained sales force. In addition, micrographics suppliers generally participate in Spain's SIMO Fair (International Office Machinery Fair) held each year in the fall. In 1971, there were 475 foreign and 161 Spanish firms exhibiting at this Fair, which is organized by C.I.T.E.M.A., Plaza del Conde del Valle de Suchil 8, Madrid 15.

Commercial advertising, a practice which has developed in Spain since 1960, is said to reach appropriate executives. Newspapers are a frequently-used medium in Spain for reaching decision-makers, but a seller of micrographics could also advertise in appropriate trade journals, three of which are: *Proceso de Datos* (address: Arga 4, Madrid 2) used for COM equipment advertising; *Alta Direccion* (address: Balmes 357, Barcelona 6) reaching the general business community; and *Banca Espanola*, (address: Ma de Molina 68, Madrid 6), read by bankers.

An important contact for the businessman seeking to sell micrographics equipment and supplies to the industrial sector is the Instituto Nacional de Industria (INI, the National Industrial Institute), the Spanish Government's holding company.

Nearly all micrographics equipment is purchased rather than rented because leasing offers no tax advantage to the Spanish user. Leasing in general is not yet a well-accepted practice, and most customers believe the lease markup is too high.

Profit margins seem to be in the area of 30% to 40%. Terms of sale usually call for payment within 30, 60, or 90 days of delivery, with a 2% discount for payment within 30 days. Large buyers and government agencies sometimes are granted quantity discounts and longer periods of payment. Delivery and payment conditions usually do not, however, have an important impact on the decision to buy. Warranties are usually one year for parts and labor, provided that the recommended films and supplies have been used. Maintenance is usually provided for in a separate yearly contract.

A micrographics trade association is being organized in Spain. However, there are three broader organizations which may be of assistance and provide information useful to the newcomer. One is the Camera Oficial

de Comercio y Industria (Official Chamber of Commerce), located at Plaza de la Independencia, 1, Madrid 1; its Vice President is Sr. Inigo de Oriol Ibarra. Another organization is the Asociacion Espanola de Automatica (Spanish Automation Association) at Facultad de Ciencias, Ciudad Universitaria, Madrid; its president is Sr. Jose M. Garcia Santesmases. A third is the Comision Espanola de IFIP (the Spanish Committee for the International Federation of Information Processing). This group is also located at the Science Department of Madrid.

Technical Standards

Spain uses the metric system of measurement. Where applicable, all equipment should be adapted to the metric standard.

All electric current in Spain is 50-hertz, single-phase, 127-volt, and 3-phase, 220-volt systems predominate. However, many new industrial installations are using single-phase, 220-volt and 3-phase, 380-volt current.

For administrative applications, 16mm. film is preferred; for reproduction of engineering drawings, 35mm. film normally is used. The 105mm. films are seldom used, and 70mm. films are not used at all.

The standard microfiche is 105mm. x 48mm., with 60 views. Sometimes a 105mm. x 48mm., 90- or 120-view microfiche is used.

The most common reduction ratios are 24:1 for documents, 30:1 for large drawings (DIN AO), and 21:1 or 15:1 for smaller drawings.

Spanish trade sources indicate that 90% of the 16mm. film used is the silver halide type. The remaining 10% of the market for this film size is split between diazo and other types of film. The use of diazo film is expected to grow rapidly with the growth of the COM market.

A loan copy of basic research report "Micrographics—Spain", DIB 73-03-501, upon which this Export Market Digest is based, may be obtained from the Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

Sweden

Sweden's economy is one of the most highly industrialized in the world, and is continuing to grow steadily. With one of the highest per capita incomes in the world, Sweden is regarded as a ready market for advanced technology.

A trend toward modernization of information systems, which began in Sweden in the late 1960's, should accelerate throughout the mid-1970's. Micrographics sales, which increased by 60% from 1968 to 1971, are expected to nearly triple from 1971 to 1976.

Highlights

► Aggressive efforts by Swedish Government and industry to continue modernization of information systems should spur a 23% annual growth rate for sales of micrographics equipment and supplies between 1972 and 1976.

► Swedish demand for micrographics products is expected to more than double from 1972 to 1976, reaching an estimated \$10.9 million in annual sales in 1976, virtually all imported.

► Over half of Sweden's micrographics purchases is imported directly from U.S. plants.

► Significant increases in computer-output-microfilm (COM) purchases by Sweden from the United States are predicted for the next few years.

► Swedish banks, government offices, and engineering departments of manufacturing corporations are the best markets for microfilm equipment, followed by hospitals, transportation companies, and libraries.

Strong Swedish demand for micrographics products offers a promising market for American suppliers, recognized as world leaders in the information systems technology. Use of U.S. computer-output-microfilm (COM) systems, which began in Sweden in 1971, has been expanding rapidly along with other types of micrographic equipment. Purchases of American-made information and microfilm systems will improve nearly every sector of Sweden's highly industrialized and urbanized economy in the years ahead.

Market Expanding Rapidly

Micrographics sales in Sweden have grown at an average annual rate of 21% since 1968, doubling from the sales level of \$2.4 million in that year to \$5.1 million in 1972 (see figure 1). In 1972, equipment sales totaled \$3.4 million, or 67% of the Swedish market for micrographics products (see table 1), while sales of supplies totaled \$1.7 million. Sales of microfilm services, including micropublishing, were estimated at an additional \$1.2 million in 1972.

Sales of micrographics products in Sweden are forecast to rise by 23% annually, reaching \$10.9 million by 1976. A high demand for cameras, readers, microfilm supplies, and COM recorders should account for the bulk of this increase.

The Swedish micrographics market is supplied almost entirely by imports. The \$2 million worth of microfilm equipment and supplies imported directly from the United States in 1971 represented more than half of total imports. Direct imports from the United Kingdom accounted for another 31% of the Swedish micrographics import market (see table 2), but some of these products come from U.S.-owned plants in England. U.S. firms are expected to remain Sweden's key suppliers of micrographics products.

Sweden is expected to purchase about \$39 million worth of micrographics equipment and supplies and

spend another \$8 million for services between 1972 and 1976.

Specific Sales Opportunities

A market survey recently conducted in Sweden for the U.S. Department of Commerce reveals that the fastest growing market for U.S. products will be for:

- 16mm. microfiche and cartridge roll film readers
- 16mm. microfilm cameras
- Electrostatic reader/printers
- Inexpensive, small-capacity COM recorders
- Automatic retrieval devices
- Diazo film
- Electrostatic paper

This is only a partial list of key items. Other micrographics products also should find a ready market in Sweden.

Cameras.—Microfilm cameras account for the largest segment of micrographics sales in Sweden today. However, readers should be the largest selling type of microfilm equipment by 1976.

Total camera sales are expected to increase by 10.7% yearly, from a 1972 level of \$1.02 million to \$1.5 million in 1976. Most of the increase will come from sales of 16mm. cameras, which now account for 73% of camera sales. Future demand likely will be for medium-price 16mm. cameras, since half of the 16mm. cameras now sold in Sweden are of the less expensive type.

Few step-and-repeat microfilm cameras are now in use, but sales could reach \$100,000 per annum by 1976. Through 1976, 35mm. microfilm cameras are expected to maintain their present \$300,000 annual

sales level. Several U.S. camera firms are represented in the Swedish market, with the only foreign competition coming from the German firm Agfa.

Readers.—Microfilm reader sales are expected to outstrip camera sales and become the principal seller in the Swedish micrographics equipment market by 1976. Market analysts anticipate a fourfold rise in annual sales of readers from 1971 levels, bringing the expected 1976 sales level to \$2.2 million, a 32% annual growth rate from the 1971 level of \$550,000.

This forecast for rapid growth is based on the fact that a number of banks, government agencies, insurance companies, and manufacturing firms plan to install active microfilm systems which will require a large number of readers of both the microfiche and cartridge roll film type. Inexpensive microfiche readers are believed to offer the best sales potential.

Reader/printers.—Sales of microfilm reader/printers, now accounting for 19% of equipment sales, are expected to increase from the 1972 level of \$700,000 to over \$1.2 million by 1976. Electrostatic reader/printers have been favorably received in Sweden, and their faster operating speed and ease of operation should assure their continued popularity. Most of this market is supplied by two U.S. corporations.

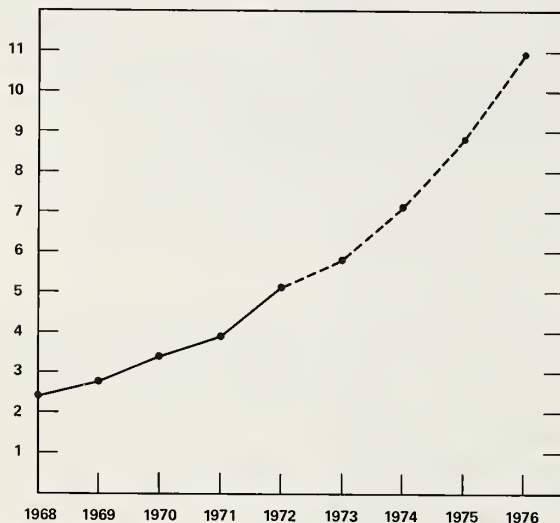
Processors and duplicators.—Swedish demand for processors and duplicators is expected to double by 1976. Annual sales of both products should reach the \$200,000 range. Processor sales are somewhat a "captive" of camera sales, and the forecast increase in duplicator sales is related to the future growth of COM recorder sales.

Automatic retrieval devices.—It is expected that automatic retrieval devices will gain increased acceptance as more COM units are installed in Sweden, despite the sales-inhibiting effect of the high price of this equipment. Annual sales should reach \$150,000 by 1976, tripling the 1971 level of sales.

Computer-output-microfilm (COM) devices.—The next few years should see marked growth in Swedish purchases of COM recorders. As of July 1972, there were six COM installations in Sweden, five of which were in service bureaus. Five of the six systems were purchased between January 1971 and July 1972. COM installations are predicted to increase to between 25 and 30 by 1976, a fivefold increase over the present six COM systems. From 12 to 15 COM units are expected to be installed in banks, four or five in insurance companies, three or four in large corporations, one or two in service centers, and six or seven in government agencies. Swedish users show a marked preference for COM equipment with microfiche capabilities. Smaller capacity COM systems are predicted to be in greatest demand.

Supplies.—Sales of microfilm supplies are forecast to experience an annual growth rate of approximately 30%, going from \$1.7 million in 1972 to \$4.6 million by 1976. Silver halide film accounts for 75% of all microfilm sales, but strong growth is forecast for diazo film (now 20% of film sales) in conjunction with increased COM usage. Electrostatic paper sales also should show steady growth as electrostatic reader/printers replace older models based on silver technology.

Figure 1. — Sweden: Micrographics equipment and supplies market, 1968–72; and projected 1973–76
(in millions of U.S. dollars)



Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Swedish trade estimates and survey of Swedish end-users.

Table 1.—Sweden: Sales of product category by principal subcategories, 1972 and projected 1976
(in millions of U.S. dollars)

Micrographics equipment	1972	1976
Cameras	1.0	1.5
Readers .....	.8	2.2
Reader/printers .....	.7	1.2
Computer-output-microfilm (COM) devices .....	.5	.7
Automatic retrieval devices .....	.1	.2
Peripheral items .....	.1	.1
Duplicators .....	.1	.2
Processors .....	.1	.2
Total	3.4	6.3
Micrographics supplies	1.7	4.6
Grand total	5.1	10.9

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Swedish trade estimates and survey of Swedish end-users.

Kodak, 3M, and Agfa now supply most of the market for microfilm supplies.

Services and micropublishing.—Total revenues of service centers are expected to show substantial gains over their 1972 level of \$1 million. This figure could reach \$1.75 million by 1976, with COM conversion service accounting for \$1.25 million in revenues and conventional services for \$500,000. Micropublishing is just getting underway in Sweden, and trade estimates are for this market to reach \$500,000 in 1976, compared to \$100,000 in 1971.

Micrographics Usage Spreading

Swedish banks have been the largest purchasers of micrographics to date, accounting for about 28% of the market (see table 3). With micrographics usage just beginning in Sweden's hospitals, the medical sector is considered a promising market for microfilm equipment and supplies. Insurance companies now account for only 2% of micrographics products sales, but they are favorable markets for the future. About half of the total market volume now is divided between Swedish Government agencies and manufacturing corporations. More than 65% of micrographics sales are made in the Stockholm metropolitan area.

Commercial.—Swedish banks, the largest customers for micrographics in Sweden, account for 28% of Sweden's total purchases. There are indications that the banking industry is about to invest in advanced dynamic micrographics systems, as opposed to their present use of microfilm equipment for passive filing and storage purposes. The larger banks have formed committees to investigate COM systems, and banks may purchase 10 to 12 COM recorders by 1976.

Four of Sweden's 16 commercial banks hold about 80% of total banking assets. Sweden's largest commercial bank, with 404 branches and \$2.6 billion in deposits, is the Skandinaviska Enskilda Banken (SE), headquartered in Stockholm. This bank's micrographics installation is limited to archive-type uses, but SE is considering the purchase of a COM unit once a new teleprocessing network is installed.

Another major bank, the Sveska Handelsbanken (SH),

with 523 branch offices and a total of \$2.4 billion in deposits, also is contemplating the installation of a COM recorder after having installed a teleprocessing network in 1973. They also now use microfilm equipment only for passive filing purposes.

Market analysts in Sweden predict that two other large banks probably will purchase COM equipment in the near future. These are the Sveriges Kreditbank, with 138 branches and \$1.1 billion in deposits, and the Sparbankernas Bank, a "central bank" for Sweden's savings institutions. These institutions reportedly are on the verge of making sizable COM equipment purchases, consisting of perhaps four to five COM units with microfiche capabilities.

The number of Swedish savings banks is now being reduced from 270 to 70 through mergers, a development which likely means more banks will see a need for advanced micrographics equipment.

Of the 950 insurance companies operating in Sweden, 70 are considered national in scale, with three of these holding a major share of the market. These large companies are prime potential customers for U.S.-made advanced microfilm equipment.

Sweden's largest insurance company, Forsakings AB Skandia in Stockholm, with assets totaling \$1.85 billion, is using a COM service bureau to issue reports for distribution to its four principal branch offices. This company is seriously considering the purchase of a COM recorder by the end of 1973 to record computer-stored data which are several years old or little used.

Trygg Hansa and Foksam's are Sweden's second and third largest insurance companies. Trygg Hansa has assets of \$1.34 billion and Foksam, \$370 million. Both now are using a COM service bureau on an experimental basis. Insurance firms are expected to become significant users of micrographics and may buy four or five COM recorders by 1976.

Industrial. — Swedish industry, which contributes about 33% of the gross national product (GNP) and is growing at an annual average rate of 5 to 7%, represents a promising market for micrographics products. Because this country's highly developed and competitive industrial sector intends to streamline its information processing systems and also to save on expensive storage space, an increase in micrographics purchases by large Swedish corporations is expected over the next few years. The industrial sector is using 35mm. equipment and aperture cards for engineering drawings, for patent reproductions, and for some security applications; 16mm. equipment with either roll film or microfiche is used for filing and in connection with management information systems.

Volvo AB in Gothenburg, Sweden's largest vehicle manufacturing firm, with annual sales of \$1.2 billion, is one of Sweden's most progressive industrial users of the micrographics. In addition to present engineering and security applications for microfilm equipment, Volvo will use an off-line COM device, acquired in May 1972, to record parts catalogs and other computer listings requiring broad distribution and/or frequent changes onto microfiche for dissemination to about 160 persons. This COM unit will streamline Volvo's paperwork flow, which in the past has amounted to over 3.5 million sheets of paper a year.

Table 2.—Sweden: Share of micrographics imports by country or origin, 1968-71
(in thousands of U.S. dollars)

	1968		1969		1970		1971	
	Value	Market share percent	Value	Market share percent	Value	Market share percent	Value	Market share percent
United States	1,300	54	1,400	50	1,800	53	2,000	52
United Kingdom	700	29	800	29	950	28	1,200	31
Other	400	17	600	21	680	19	650	17
Total	2,400	100	2,800	100	3,430	100	3,850	100

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Swedish trade estimates.

Volvo's other equipment purchases will include 500 or more readers and one or two duplicators.

Atlas Copco AB, a Stockholm-based firm specializing in the manufacture of mining machinery and compressors, has a 35mm. microfilm system using aperture cards. A Fourier planetary camera and printer, together with 13 Caps readers, comprise this company's microfilm equipment.

Sweden's electrical engineering industry is also expected to be a major purchaser of micrographics. Its total production was valued at \$950 million in 1969 and has been growing at 10% annually.

ASEA, in Kopparbergsv, Vasteras, Sweden's largest manufacturer of heavy electrical equipment, uses a 35mm. system to microfilm technical drawings for transfer to aperture cards, a 16mm. jacket system for microfilming reports on testing and design of equipment, and a 16mm. system for microfilming correspondence and incoming and outgoing orders. ASEA's equipment includes five Kodak planetary cameras, 12 Kodak Reliant 600's, three Prostar processors, three Kalle RV 410 duplicators, three Ozalid 3020 duplicators, and several 3M readers and reader/printers, as well as a large number of readers manufactured in-house. ASEA is reported to be looking into COM techniques for personnel files, stock control, sales lists/data, and economic reports.

Electrolux AB in Stockholm, a large manufacturer of electrical equipment and appliances, uses microfilm equipment consisting of a Recordak camera, two readers, and a reader/printer, for security purposes and to microfilm parts lists. The company does not microfilm technical drawings at present. Electrolux AB is potentially a large micrographics customer.

Government.—Purchases of micrographics products by all branches of the government—\$1.3 million in 1972—approximately equal those of industry. The Swedish Federal Government is the largest single micrographics customer within this sector, with purchases made centrally by Statskontoret, the agency for Administrative Rationalization and Economy, in Stockholm. The Swedish Government also has a data-processing service company called DAFA, a part of the Ministry of Finance, which often consults with the Statskontoret on data-processing and technical micrographics matters.

One of the largest microfilm users within the Swedish Government is Postbanken, a Stockholm-based postal savings bank. Microfilming of savings withdrawal and

deposit slips, as well as transfer payments and daily statements (120,000 to 200,000 a day), is done with special equipment manufactured by Recognition Equipment Co. of Texas. This equipment, purchased directly from the United States, records and microfilms 800,000 to 1.3 million transactions a day using separate film in 1,200-foot rolls. The use of COM recorders with microfiche is now being seriously considered by Postbanken to facilitate auditing and the investigation of customer complaints and to send information to selected customers.

Another major government customer, the Police Records Department in Stockholm, combines an advanced microfilm system with an EDP system for maintaining passport records, criminal and crime records, and fingerprint records. Their installation includes three Kodak 16mm. cameras, 25 readers (3M and Kodak), and 10 reader/printers. Consideration is now being given to acquiring a COM recorder for work concerning passports and criminal records.

The Swedish Department of Defense, which has a 35mm. aperture card system for storing technical drawings, is using a COM service bureau on an experimental basis and is contemplating the purchase of a COM unit.

DAFA, the government-owned EDP service center, is now examining COM applications as they relate to government work. DAFA is likely to purchase two COM units within 5 years, probably off-line COM units with microfiche facilities, and may operate as a government service bureau.

Larger municipal governments, including those of Stockholm, Gothenburg, and Malmo, represent smaller but growing markets for micrographics products. The city of Stockholm, for example, now microfilms the plans for housing construction projects, water and sanitation projects, and loans to students.

Medical.—Approximately 8% of Sweden's GNP, or \$2.8 billion annually, goes to health and medical care. In addition, Sweden has the highest number of hospital beds per capita in the world. Yet, Swedish medicine represents a relatively untapped market for micrographics products.

A pilot study on hospital uses of microfilm is now underway with the Helsingborg Hospital near Malmo and Central Hospital in Eskilstuna as participants. The Swedish Planning and Rationalization Institute of Health and Social Services in Stockholm is funding this study to see if micrographics usage can make hos-

Table 3.—Sweden: Value and market share of micrographics products consumption by principal user sectors, 1972

(in thousands of U.S. dollars)

Sector	1972	Percent
Commercial	1,530	30
Government	1,275	25
Industrial	1,275	25
Others	1,020	20
Total	5,100	100

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values and market shares based on Swedish trade estimates.

pital recordkeeping more efficient.

Helsingborg Hospital is experimenting with a microfilm jacket system, and Central Hospital is trying a cartridge system with an index. These studies are showing positive results, and another 20 hospitals are expected to become micrographics customers within the next few years.

Libraries.—Apart from school and university libraries, there are approximately 300 public libraries in Sweden, most of which have readers and a reader/printer for reading newspapers in roll films. Most of the larger libraries microfilm their book-lending operations, using a reader to pinpoint overdue books. Some of the large libraries have equipment to read microfiches from the United States.

Now under study is a library information system called LIBRIS which, with Statskontoret assistance, would link all the larger public and university libraries in Sweden by an on-line teleprocessing system. Since this would require putting all library catalogs on microfiche, its adoption would expand the market for low-cost microfiche readers.

Transportation.—The largest public utilities micrographics user is Scandinavian Airline System (SAS), headquartered in Bromma, which has microfilmed its maintenance manuals and illustrated parts catalogs on 16mm. rolls and cassettes. Some 10,000 to 12,000 pages are microfilmed each month. The airline's equipment includes one Kodak Reliant 600 camera, 80 3M motorized reader/printers, 20 3M motorized readers, one processor, and two GAF diazo duplicators. SAS plans to expand its in-house micrographics installation within the next few years.

Service centers.—Sweden has three conventional and five COM service centers. The largest COM service center, Auriga AB in Stockholm, leases a Beta off-line COM recorder. ADB Produktion, also in Stockholm and the second largest COM service center, leases an on-line 1603 Memorex COM recorder and is planning to acquire an off-line COM recorder with microfiche facilities by the end of 1973. Stockholm-based Esselte uses a Pertec off-line COM, while Multidata Corporation, in Molndal, uses a 1603 Memorex COM. Another COM service center probably will soon be operating in Malmo.

Among the conventional service centers, Rekolid in Stockholm specializes in microfilming Swedish newspapers. Except for Rekolid, Esselte AB is the only firm

now in micropublishing (they also have been microfilming Volvo's spare parts catalog). Another firm, Gotab AB of Gothenburg, is considering entering the micropublishing field.

Legal Aspects of Microfilm

In Sweden, the legal status of microfilmed documents is at the discretion of the judge, who can either reject or accept it as an indication of legal proof. The law now states that most commercial documents must be kept in their original form for 5 to 10 years, and real estate documents must be kept indefinitely.

It is anticipated that the micrographics manufacturers represented in Sweden will form a Swedish association and will try to lobby for new legislation making microfilmed documents admissible as legal evidence under certain conditions. Adoption of such legislation would prompt increased sales of micrographics products.

Competitive Environment

Exports of micrographics equipment and supplies from the United States comprise just over 50% of the total Swedish import market. The United Kingdom is the United States' closest competitor, accounting for 31% of the Swedish import market, or \$1.2 million in sales for 1971. However, many of these imports come from subsidiaries or plants of U.S. corporations in England.

U.S. firms are expected to remain Sweden's foremost suppliers of micrographics products, a position which will be bolstered by the predicted growth in sales of COM equipment, all expected to be imported from the United States.

The following types of equipment are sold in Sweden through sales subsidiaries: Agfa Bevaert, DatagraphiX, Kodak, Memorex, 3M, and Rank Xerox. The Swedish firm, Esselte System AB, is the sales agent for the following U.S. firms: Bell & Howell, DASA, Image Systems, Microdesign, Pertec, and Realist.

Low Customs Duties

Sweden is a member of the European Free Trade Association (EFTA), and imposes no customs duties on imports from other EFTA countries. Exemption of customs duties for products from non-EFTA countries is allowed under special circumstances. Otherwise, customs duties are levied on the c.i.f. value of imports.

Following are the duties as they apply to imported micrographics equipment and supplies from non-EFTA countries: Cameras, 5%; readers and reader/printers, 5%; duplicators and processors, 5%; film in rolls is admitted duty-free. A sales tax of 17.65% is assessed on c.i.f. prices (plus customs duties, if applicable) for imports from all countries.

Sales Development

Sales and distribution of microfilm equipment and supplies in Sweden are now dominated by Esselte, Memorex, 3M, and Kodak, the latter three companies being U.S. subsidiaries. These companies have their own demonstration showrooms and sometimes hold technical seminars and other presentations.

Micrographics manufacturers and distributors may exhibit their products in Sweden at the Office Data Fair, held every two years in Stockholm. The next exhibition will be held October 4-11, 1973. At the 1971 exhibition, 1,500 exhibitors (about half were foreign), demonstrated their equipment to an estimated 67,000 trade visitors.

Magazine advertising is also used for sales development in Sweden, and the following periodicals are used: *Modern Datateknik* and *Data*, both data-processing magazines, and *Veckans Affärer*, a general business journal.

From time to time, The Swedish Data Association in Akersberga conducts COM seminars, and also publishes an annual list, "Data Marknaden," of their corporate members.

Technical Requirements

Sweden uses the metric system of measurement, and all equipment should be adapted to the metric standard where applicable.

Electrical current in Sweden is 220 volt, single-phase, and 380 volt, 3-phase, 50 hertz.

The standard microfiche is 105mm. x 48mm., 60 images; 105mm. x 48mm. microfiche, 90 or 120 images is sometimes used. A committee of the Swedish Standard System has been formed to devise Swedish standards for micrographics. Films most widely used are 16mm. and 35mm. types, while 70mm. are not used and 105mm. are rarely used.

The most common reduction ratios are 24:1 for documents, 30:1 for large engineering drawings, and 21:1 or 15:1 for smaller engineering drawings.

A loan copy of basic research report "Micrographics—Sweden," DIB 73-03-506, upon which this Export Market Digest is based, may be obtained from the Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

Switzerland

Switzerland, a highly industrialized nation, is always interested in finding new and better ways to conduct business.

This progressive attitude, combined with the fact that Switzerland's economy is prospering, offers a favorable outlook for sales of advanced micrographics equipment.

Established trading patterns and the close relationships of Swiss and U.S. firms put American suppliers in an excellent position to capitalize on Switzerland's rapidly growing micrographics market. American suppliers play a leading role in Swiss micrographics procurement through the systems evaluation advice they offer prospective purchasers.

Highlights

► The Swiss market for micrographics equipment and supplies is expected to rise 28% annually over the period 1972 to 1976, going from \$2.7 million to \$7.3 million.

► The value of imports in 1972 was equal to the total Swiss consumption of the product category.

► The U.S. share of the Swiss micrographics market was 60% in 1971, yielding over \$1.2 million in sales.

► If U.S. suppliers retain their present share of the market, as expected, imports from the United States should more than triple to about \$4.5 million in 1976.

► The world-famous Swiss banks are the nation's principal buyers of advanced micrographics products.

► Readers, reader/printers, and computer-output-microfilm (COM) devices offer highest sales prospects for U.S. manufacturers.

Market Expected To Grow 28% a Year

The micrographics market in Switzerland is expected to expand rapidly in the 1970's. Total Swiss consumption of micrographics equipment and supplies grew from \$995,000 in 1968 to an estimated \$2.1 million in 1971 (see figure 1).

Current demand for micrographics equipment and supplies is met almost entirely by imports. The demand through 1976 is also expected to be met largely by imports (see table 1).

Equipment sales in 1971 accounted for about \$1.4 million, or a 67% share of the total market; supplies accounted for \$700,000, or a 33% share. Trade sources predict an average annual market growth rate of 28%, nearly all in 16mm. products.

By 1976, total purchases of micrographics products are projected to reach \$7.3 million, comprised of \$4.1 million in equipment and \$3.2 million in supplies.

The United States has been the primary source of Swiss imports of the product category, supplying a 57% share (\$700,000) of the market in 1969. The U.S. market share rose to 60% in 1971 for a value of 1.2 million. Other major suppliers in 1971 were France and Germany, the former supplying \$630,000, a 30% share of the market, and the latter \$110,000, a 5% share (see table 2).

Specific Sales Opportunities

An extensive on-location study recently conducted for the U.S. Department of Commerce reveals that the following micrographics products are in the greatest demand:

- 16mm. cameras
- 16mm. readers

- Reader/printers
- Small capacity on-line and off-line COM devices
- Electrostatic paper

Cameras.—Camera sales are expected to climb from \$400,000 in 1971 to \$700,000 in 1976, an average annual rate of 12% (see table 3). Local trade sources predict that 16mm. camera sales will grow faster than sales of 35mm. cameras. Sales of 16mm. cameras, valued at \$200,000 in 1970, are expected to increase 22% annually to about \$550,000 in 1976. During the same period, sales of 35mm. cameras are expected to remain stable around the \$200,000 annual level. Step-and-repeat cameras are in limited demand.

Reader/printers.—Reader/prINTER sales are expected to increase from \$300,000 in 1971 to \$900,000 in 1976, an average annual growth rate of 25%. Electrostatic reader/printers are displacing other types of reader/printers on the Swiss market.

Readers.—The demand for readers is expected to grow faster in the next few years than the demand for any other micrographics hardware. Sales of readers are expected to increase sixfold, from \$250,000 in 1971 to \$1.5 million in 1976. Demand will be strongest for moderately priced (cartridge, roll film, and microfiche) readers. A number of major banks, government agencies, and industrial and insurance companies are expected to introduce large-scale micrographics systems within the next 3 years. These systems are expected to stimulate demand for high-quality readers.

Computer-output-microfilm (COM) devices.—Switzerland now has five COM systems all operated by commercial service centers. Some 25 additional COM systems are expected to be installed in the country during

the next 5 years, with about half that number going to banks, two or three to insurance companies, three or four to industrial corporations, one or two to service centers, and three to five to government agencies. Annual COM sales should advance from an estimated \$200,000 in 1971 to about \$400,000 in 1976. Swiss user needs suggest that small-capacity equipment is likely to be in greater demand than larger, more expensive systems.

Processors.—Processor sales should reach \$240,000 in 1976, up from \$100,000 in 1971. Swiss users frequently buy the processor recommended by their camera supplier.

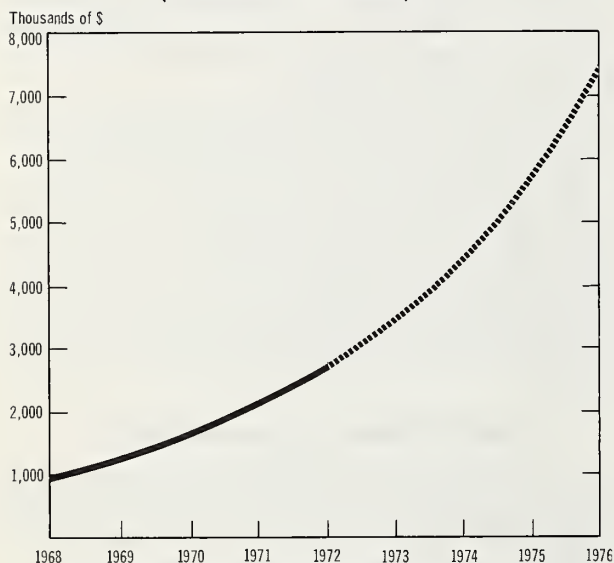
Duplicators.—Due mainly to the increased market penetration of COM recorders, Switzerland's duplicator purchases are expected to expand from \$100,000 in 1971 to about \$240,000 in 1976.

Automatic retrieval devices.—Sales of automatic retrieval devices in Switzerland are minimal and are expected to continue to be minimal until prices decrease significantly.

Supplies.—Sales of supplies are forecast to surge from \$700,000 in 1971 to \$3.2 million in 1976, an average annual growth rate of 35% a year. Diazo film consumption, which is growing at a much higher rate than other supplies because of the increased use of COM's, will nearly double each year. Silver halide type film now accounts for 75% of the total film market: diazo, 20%; others, 5%.

Services.—Total revenues generated by conventional microfilm service centers should increase from \$250,000 in 1971 to \$600,000 in 1976; COM service center revenues will show a higher rate of growth, increasing from \$250,000 in 1971 to \$700,000 in 1976. No firms in Switzerland are now engaged in micropublishing. However, the French publishing giant, Hachette, plans to set up micropublishing operations in Switzerland. Should this occur, micropublishing revenues could reach an annual level of about \$300,000 by 1976.

Figure 1. - Switzerland: Size of market for micrographics equipment and supplies, 1968-72; and projected 1976
(in thousands of U.S. dollars)



Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Swiss trade estimates.
Note: Size of market equals production plus imports minus exports.

Prospects Favorable for U.S. Exporters

The commercial and industrial sectors of the Swiss economy offer the most promising markets for micrographics equipment. Banks alone represent one-third of all sales of micrographics equipment and supplies and the industrial firms about 25% (see table 4). The Swiss Government, which accounts for an estimated 15% of total consumption, is also an attractive sales target for U.S. micrographics equipment suppliers. Future growth markets include hospitals and international organizations headquartered in Switzerland.

Commercial.—Switzerland has 478 banks with 4,446 branches, or about one for every 1,400 citizens; the country is said to have more bank accounts than inhabitants. Total assets of all Swiss banking institutions rose by \$4.5 billion to \$444 billion in the first three quarters of 1971. Prospects for the next 5 years are for a growth of assets averaging 8 to 10% per year.

The "Big Five" banks (Union Bank of Switzerland, Zurich; Swiss Bank Corporation, Basel; Swiss Credit Bank, Zurich; Banque Populaire Suisse, Bern; and Bank Leu, Zurich), together with 28 cantonal banks (the largest are Zürcher Kantonalbank, Zurich, and Kan-

Table 1.—Switzerland: Size of market for micrographics equipment and supplies, 1968-72, and projected 1976

(in thousands of U.S. dollars)

	1968	1969	1970	1971	1972	1976
Production	80	80	100	125	180	400
Imports	995	1,230	1,685	2,100	2,750	7,330
Exports	80	80	100	125	180	400
Market size	995	1,230	1,685	2,100	2,750	7,330

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Swiss trade estimates.

Note: Size of market equals production plus imports minus exports.

tonal von Bern, Bern), account for roughly 75% of the balance sheet total for all Swiss banking. The "Big Five" themselves control over 46% of the total assets of all Swiss banks.

Specialization of banking services is not very highly developed within the Swiss banking system; all categories of banks (big banks, cantonal banks, local and savings banks) engage to differing degrees in commercial transactions, mortgage loans, and savings.

Swiss banks now use micrographics equipment mainly to record and store information. The recording and distribution of centrally processed active information to local branches has not been widely adopted. Within the next 4 years, however, the five largest banks and some major cantonal banks are expected to be using COM recorders, making banks a major growth market for micrographics products. Trade sources predict that banks will buy 12 to 15 COM's within the next 5 years. The smaller, less expensive (both on-line and off-line) units are expected to have best sales potential.

The Swiss Bank Corporation, Switzerland's second largest bank, with assets totaling \$7.8 billion and 130 branches, now has about 140 Kodak Recordak Reliant cameras. Its facilities also include a large number of Kodak and 3M readers and reader/printers. Checks, travelers' checks, postal checks, customer statements, and all branch accounting are microfilmed. An internal study group has been formed to look into the feasibility of using COM recorders. Expectations are that this bank will install three COM units by mid-1974, one each in Zurich, Geneva, and Basel.

Swiss Credit Bank, Switzerland's third largest bank, with assets totaling \$7.7 billion and 80 branches, has about 100 Kodak Recordak Reliant microfilers and about 80 readers and reader/printers acquired from Kodak and 3M. Microfilm applications are similar to those of the Swiss Bank Corporation. An internal group has been formed to study the feasibility of using COM recorders, and two COM's are likely to be acquired by this bank by the end of 1974.

Zuricher Kantonal is Switzerland's largest cantonal bank with total assets of \$2.4 billion and 66 branches. It has been using micrographics equipment for 2 years for microfilming checks, travelers' checks, and customer statements. Some 4,000 to 5,000 documents are microfilmed daily. Future plans of this bank include the installation of a COM system; it will probably lean toward the on-line COM configuration.

Kantonalbank Schwyz, a cantonal bank with total assets of \$300 million, has been using micrographics equipment for the last 2 years. It uses Bell & Howell and Agfa Gevaert Copex cameras and readers in its head-

quarters in Schwyz.

First National City Bank (FNCB) in Geneva has recently installed an on-line COM Memorex 1603 and is selling COM service through its subsidiary, City Corp. Data, Geneva. FNCB uses its COM system for statement reports and sells 90% of its COM time to outside customers. Its expansion plans include the installation of a microfiche system based on a second COM recorder.

Swiss insurance companies represent a large potential market for micrographics equipment and supplies, even though the law now requires these companies to keep all original documents for many years: no company has yet tried to evaluate the cost effectiveness of adopting microfilm technology versus the costs of losing a lawsuit because of failure to submit original documents as evidence. Although no Swiss insurance company is now a major user of micrographics equipment, more and more companies are investigating the potential of micrographics equipment as a means of coping with their mounting paperwork problems. The best export sales prospects in this segment of the market lie in automatic storage and retrieval devices and COM systems.

One of the most progressive users of micrographics equipment in the insurance field is the Zurich Versicherungs-Gesellschaft (ZVG). It is the largest insurance company in continental Europe, with subsidiaries in 24 countries. Premium revenues in 1971 totaled \$497 million, up 15.3% from 1970 levels. It underwrites accident and automobile coverage and has subsidiaries in life insurance and reinsurance. ZVG is installing a 16mm. microfilm storage and retrieval system to complement its computerized data handling operations. It is using a service center to design the system and will soon be buying a quantity of advanced readers.

Other Swiss insurance companies considered to be prime potential customers for micrographics equipment and systems include Baloise-Holding, Berner Allgemeine, Genevoise Vie, Helvetia, and Winterthur Accidents.

Industrial.—The industrial sector accounts for 37% of the Swiss gross national product and has been growing at 6 to 8% a year in real terms for the last 10 years. It is expected to continue to grow at this rate over the next decade. The industrial sector represents about 25% of the micrographics market, with engineering applications constituting more than 50% of this share.

The Swiss chemical industry, which accounts for 15% of the country's gross annual industrial production, is expected to grow at about 12% a year over the next 5 years. The great bulk of Switzerland's chem-

Table 2.—Switzerland: Value and market share of imports of micrographics equipment and supplies by country of origin, 1969-71

(in thousands of U.S. dollars)

	1969		1970		1971	
	Value	Market share percent	Value	Market share percent	Value	Market share percent
United States	700	57	925	55	1,250	60
France	300	25	500	30	630	30
Germany	125	10	90	5	110	5
Others	95	8	170	10	110	5
Total	1,220	100	1,685	100	2,100	100

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Swiss trade estimates.

ical output is exported. In addition, the biggest Swiss chemical concerns have manufacturing subsidiaries all over the world, and the output of the subsidiaries is often larger than that of the parent firm.

The combined 1970 turnover of the three big Swiss chemical groups (Hoffman-La Roche, Ciba/Geigy, Sandoz) totaled \$3.7 billion, half of which was accounted for by the pharmaceutical products sector. Switzerland's pharmaceutical production ranks second only to that of the United States.

The chemical industry is concentrated in the cantons of Basel-Town, Basel-Country, Basel Zurich, Valais, Aargau, Berne, Grisons, and Geneva. Basel is the center of the industry.

Ciba-Geigy, Basel, a group formed in October 1970 by the merger of Ciba and Geigy, is Switzerland's largest chemical company, with 1971 sales at \$1.9 billion and an expected corporate growth rate of about 12% annually over the next 5 years. It has the highest export rate of all the world's chemical companies, exporting 98% of its output.

Ciba-Geigy has adopted the use of micrographics equipment for microfilming patents for distribution to branches and overseas subsidiaries. It also microfilms some of its accounting and administrative records for security purposes. The equipment belonging to this firm includes three 3M Filmas 16mm. cameras (models 200 and 400). It should be noted that Ciba-Geigy Ilford, Ltd., a British-based film manufacturing company also markets microfilm.

Hoffman-La Roche, Basel, is Switzerland's third largest firm, with sales totaling over \$1.4 billion in 1971. This firm has installed a micrographics system mainly for handling administrative records. Future plans include acquisition of a COM system.

The Swiss food processing industry is strong, diversified, and heavily dependent upon exports, notably of chocolate and cheese. In their drive for more efficiency, the Swiss food manufacturing firms must modernize not only their capital machinery but also their information handling procedures. Nearly 130,000 Swiss are employed in this industry; 142 firms have over 100 employees, and 21 employ over 500 workers.

Nestle Alimentana S.A., Vevey, is Switzerland's largest food company, with an annual turnover of \$3.7 billion in 1971. It is one of the world's largest food manufacturing firms, with production facilities and distribution networks throughout the world. About 53%

of its revenues originate from Europe and approximately 33% from the Western Hemisphere. The Nestle group owns Enterprises Maggi S.A. and Findus International S.A., two high-volume food processing firms in Switzerland.

Nestle employs a 35mm. aperture card system for microfilming engineering drawings. A second micrographics installation, a 16mm. microfilm system, is utilized to record all sales orders and invoices, technical articles, and other documentation.

The microfilm department of Nestle now uses Kodak Recordak cameras (models Micro-File MRD-2 and Reliant 600), Xerox model 1824 printer, and a number of readers and reader/printers acquired from Kodak and 3M. With an annual micrographics equipment budget of about \$50,000 for 1973, Nestle will be looking at such equipment as cameras, portable readers for jackets, and reader/printers.

Switzerland's machinery and equipment companies, employing some 300,000 persons, comprise the country's most important industry. Eight firms employ over 5,000 workers, and several hundred firms have more than 50 employees. The industry's annual output is expected to grow an average of 18 to 22% through 1976. Knowledgeable trade sources predict that three or four COM recorders will be installed by machinery and equipment companies during the next few years.

Brown Boveri S.A., Baden, with sales of \$1.2 billion and exports of \$870 million in 1970, is one of the country's largest machinery manufacturing firms. Micrographics technology was introduced by this concern as early as 1958. It now uses a 35mm. system for engineering drawing applications and a 16mm. system for microfilming accounting and personnel records. The firm's incoming and outgoing mail, as well as computer output data, is also recorded on microfilm.

Brown Boveri's equipment comprises five Kodak planetary cameras, 100 Kodak readers, one Xerox 5BC printer, two Xerox 1824 printers, and one Caps Jeffrey printer. The firm's expansion plans include the acquisition of 240 additional readers, a COM recorder, and a 16mm. film jacket system for microfilming patents.

Landis and Gyr S.A., Zug, manufactures industrial and precision instruments and holds 10% of the world market. It recently began manufacturing automatic control and measuring systems. Landis and Gyr, employing over 13,000 workers, had total revenues of \$130 million in 1970. This firm uses a service bureau to

Table 3.—Switzerland: Sales of product category by principal subcategories, 1971, and projected 1976

(in thousands of U.S. dollars)

	1971	1976
<i>Micrographics equipment</i>		
Cameras	400	700
Reader/printers	300	900
Readers	250	1,500
Computer-output-microfilm (COM) devices	200	400
Processors	100	240
Duplicators	100	240
Peripheral items	50	150
Total	1,400	4,130
<i>Micrographics supplies</i>	700	3,200
Grand Total	2,100	7,300

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Swiss trade estimates.

microfilm its accounting records, since it has not yet introduced micrographics operations. However, Landis and Gyr reportedly is considering installing its own in-house micrographics system.

Buhler S.A., Uzwil, with annual revenues exceeding \$100 million, specializes in the manufacture of heavy machinery for the food industry. A micrographics department based on 35mm. equipment was organized by this firm in 1956. It now uses aperture cards extensively for engineering drawing applications. The micrographics equipment used by this firm includes one Agfa Gevaert planetary camera, 10 Zeutschell readers, one Caps automatic MA8 printer, and one Zeutschell duplicator. Buhler plans to install shortly a 16mm system, consisting of two cameras and several readers; future plans include the installation of a film jacket microfilming system.

Rieter S.A., Winterthur, with annual sales of \$55 million, manufactures textile machinery. Microfilming of engineering drawings was initiated by this firm in 1966. A committee was set up recently to study the use of microfilm in other applications.

Government.—Swiss Federal Government agencies are well aware of the advantages of micrographics systems; the Post Office, the Swiss Railways, the Ministry of Defense, the munitions factories, and the Federal Archives all use microfilm. Eidgenossosche Druck und Material Zentrale (EDMZ) buys office equipment and supplies for a number of federal government departments and has a special section which deals with micrographics equipment purchases. EDMZ is planning to establish an in-house microfilm center equipped with two COM recorders, which would enable it to provide micrographics services to other government agencies.

The Swiss Post Office, Telephone and Telegraph Service (PTT) is the largest user of microfilm in Switzerland. Great reliance is placed on microfilm techniques by PTT to handle and control its postal data; to maintain and update data on its postal checking accounts (numbering about 400,000 with deposits of over \$100 million); and to speed up its telephone inquiry system by using microfiche in lieu of telephone books. Equipment used includes 250 readers in the

main post office branches. PTT probably will be using a COM recorder within the next several years to record cash transactions and transfers from account to account within the postal banking system.

The Ministry of Defense uses jacket systems for microfilming certain special reports, technical drawings, photographs, and parts lists. The munitions factories have established 35mm. microfilming systems for engineering drawing applications. The Federal Archives has started to microfilm some of its files for security purposes.

Switzerland has 25 cantons, each with its own legislative body and law courts. Some of the larger cantons have introduced microfilm techniques in their data processing operations. The Canton of Basel uses micrographics equipment to record citizens' changes of address and tax returns. It is considering acquisition of a COM recorder. The city of Bern has been using micrographics equipment since 1955. Plans of buildings and photographs of the city are recorded on 35mm. role film.

The Canton of Zurich has purchased a Memorex on-line COM system and 25 readers. The COM system will be used to record on microfilm the automobile road tax and other cantonal tax information. It will also be used to handle personnel, insurance, and accounting records. The larger cantons (Zurich, Bern, Vaud, Aargau, St. Gall, and Geneva) are showing strong interest in COM devices.

Libraries.—Swiss libraries have been slow in introducing micrographics equipment, mainly because of budgetary constraints. Some libraries (Bibliotheque Centrale et Universitaire de Fribourg, Bibliotheque Publique de Geneva, and Zentralbibliothek Zurich) have a few readers and reader/printers which are used with microfilm acquired from American institutions. The library of the Ecole Polytechnique of Zurich is the only library with a camera, a Microbox 35mm. planetary model. Notwithstanding their present meager machine resources, libraries are expected to become an increasingly important market for micrographics hardware in the years ahead.

Hospitals.—Microfilm is seldom used by hospitals in Switzerland. An exception is the Cantonal Hospital of Zurich, which maintains a Kodak film jacket microfilming system used primarily for handling patient medical records. Other hospitals are expected to follow this institution in establishing similar micrographics systems within the next few years.

Table 4.—Switzerland: Value and market share of micrographics consumption by principal user sectors, 1972

(in thousands of U.S. dollars)

Sector	1972	Percent
Commercial	\$40	40
Industrial	525	25
Government	315	15
Other	420	20
Total	2,100	100

Source: U.S. Department of Commerce, Bureau of International Commerce market research study. Values are based on Swiss trade estimates.

Airlines.—Switzerland's flag airline, Swissair, has been using micrographics equipment since 1969. Present usage is primarily for microfilming administrative records and parts catalogs. Swissair's facilities are comprised of one Agfa Gevaert Copex D4000 camera with an automatic Copex processor, a Kalle duplicator, 83 3M 400C reader/printers, and 115 Washington Scientific Industries portable readers. Swissair is considering expanding its existing installation by purchasing a COM recorder.

Railways.—Swiss Railways transported 169.3 million passengers between January and September 1971, with revenues reaching \$356 million in that period. It is one of the largest users of micrographics equipment in Switzerland.

A 35mm. system is utilized extensively for technical drawing applications. About 400,000 of Swiss Railways' 1.9 million drawings have been mounted on aperture cards. Swiss Railways also uses a 16mm. systems for microfilming incoming and outgoing mail and checks. Personnel and medical records are kept in 16mm. jackets. Swiss Railways' micrographics facilities include a COM recorder, some 40 readers, and 10 reader/printers.

Within the next few years, Swiss Railways hopes to expand its current system by installing a second COM unit and additional readers and reader/printers.

International organizations.—Major international organizations headquartered in Geneva and Berne also are good potential customers for micrographics equipment. Geneva is the administrative center of several international organizations, including the Universal Postal Union, the World Health Organization, the International Telecommunications Union, and the World Meteorological Organization. Although these organizations have trailed other user groups in adopting microfilm techniques, they are expected to move rapidly into microform systems to accommodate their vast volume of paperwork.

One international organization that has ventured into the micrographics field is the International Labor Organization (ILO). Its micrographics equipment is comprised of 40 Bell & Howell microfiche readers, 20 roll film readers, 12 3M reader/printers, and one N. B. 404 jacket duplicator. ILO each month receives some 4,000 periodicals and publications from countries all over the world, including 60 to 70 publications on 35mm. roll film supplied by University Microfilm, Ann Arbor, Mich. ILO uses a service center in the United States to record its statistical data on microfiche. Its administrative archives are microfilmed by a local service center.

Service centers.—Five commercial COM service centers are in operation in Switzerland. These centers, with the type of equipment employed shown in parentheses, are Kodak A.G., Zurich and Geneva (Kodak KOM-90); Tages Anzeiger, Zurich (Memorex 1603); City Corp. Data, Geneva (Memorex 1603); and SMUV, Berne (Memorex 1603). The COM recorders installed at these centers (except Kodak) operate on-line.

In addition, about eight conventional microfilm service centers are operating in Switzerland, concentrated in Zurich, Geneva, and Berne. They are run mainly by micrographics equipment manufacturers or their local

representatives. The largest of the independent service centers is Walter Rentsch AG., Zurich.

With a predicted increase in demand for COM services, one or two new commercial COM service centers may be expected to open in Switzerland over the next 2 to 3 years. However, COM service centers may face competition from certain banks and insurance companies that are considering selling their spare COM time to outside customers.

Legal Aspects of Microfilm

At present, microfilm documentation cannot be used as legal evidence in Swiss courts. A judge may, at his discretion, either consider microfilm as an indication of documentary evidence or refuse to admit it into the court record. Most commercial documents must be kept in the original for 5 to 10 years; real estate documents must be kept indefinitely.

Suppliers of micrographics products in Switzerland are forming a microfilm association. The association will lobby for legislation making microfilm records admissible evidence in court proceedings under specified conditions.

Should such legislation be enacted, it will hasten the acceptance of microfilm by potential buyers in all sectors of the economy. Expectations are that a 5% extra increase in sales of micrographics products will materialize in the first year following enactment of such legislation, and an extra 3% annual increase in the years following.

Competitive Environment

To fill Swiss demand for micrographics products during the period 1973-76 will require that the country import over \$21 million worth of equipment and supplies. About 60% of these requirements—or \$18 million worth of micrographics products—is expected to be provided by U.S. exporters. Much of the remaining \$8 million of the total micrographics products purchases over the same period is expected to go to foreign subsidiaries of U.S. micrographics firms. Direct exports from the United States, placed at \$1.2 million in 1971, are forecast to more than triple to \$4.4 in 1976.

French suppliers now hold about 30% of the import market and are expected to increase their share to about 35% by 1976. The predicted rise in imports from France reflects an anticipated increase in sales of micrographics supplies to Switzerland by French-based U.S. subsidiaries. West Germany, the only other notable supplier, holds a mere 5% market share.

One Swiss firm, Alos AG, manufactures micrographics equipment under license; more than 98% of its production is exported.

About 15 foreign firms in the micrographics field are active in the Swiss market; eight of these are American. While 1971 trade figures showed U.S. suppliers accounting for about 60% of all Swiss imports of micrographics products, this percentage does not reflect imports supplied by European-based manufacturing subsidiaries of U.S. firms.

U.S. firms selling micrographics products in Switzerland through local sales subsidiaries are Kodak, 3M,

NCR, Memorex, and Xerox. Kodak has shown remarkable growth in the 16mm. equipment segment of the market. In the supplies area, Kodak's film has had wide sales. Kodak operates its own microfilm service centers in Zurich and Geneva.

3M readers and reader/printers for both 16mm. and 35mm. systems have made successful inroads to the Swiss market. NCR is making determined efforts to introduce in Switzerland its PCMI ultrafiche systems.

Memorex has had great success with its 1603 COM recorder. Memorex has installed four of the country's five COM systems. Xerox is active in marketing its 1824 printer/enlarger and 1860 machine.

Other U.S. micrographics suppliers active in the Swiss market are Bell & Howell, Pertec, and Dasa. Bell & Howell equipment has had a high degree of acceptance in banking and financial institutions.

The major "foreign" competition in the Swiss market comes from Agfa-Gevaert (Belgium), J. H. Mullens N. V. (Netherlands), Caps Equipment Ltd. (U.K.), and Cannon Camera Co., Ltd. (Japan).

Switzerland is a member of the European Free Trade Association (EFTA) and a member of the General Agreement on Tariffs and Trade (GATT). No customs duties are payable on imports from other EFTA countries. Customs duties are levied on the cost, insurance, and freight (c.i.f.) value of imports from nonmember countries. Trade negotiations are now going on between the European Economic Community (EEC) and Switzerland for a mutual phasing out of duties on industrial products by the end of 1977.

The Swiss import tariff system is based on the Brussels Tariff Nomenclature (BTN) classification. Duties are levied on a specific basis. They are assessed on the basis of the gross weight, except in cases where the tariff provides for collection of duty on a per unit basis. Import duties for micrographics equipment and supplies are imposed at rates of \$0.075 to \$0.25 per kilogram. Information on specific duty rates may be obtained from the Office of International Marketing,

Domestic and International Business Administration, U.S. Department of Commerce, Washington, D.C. 20230.

A sales turnover tax is assessed on imports of industrial products into Switzerland. The tax is 6% of the c.i.f. value if the goods are consigned to a wholesaler, and 4% if the goods are imported by a firm for its own use. Switzerland probably will introduce a value added tax to replace its turnover tax by 1974. No decision has yet been made, pending the outcome of trade negotiations between Switzerland and the EEC.

Technical Standards

Switzerland uses the metric system of weight and measures. Where applicable, all equipment should be adapted to the metric standard.

Electrical current in Switzerland is 220-volt, single-phase, and 380-volt, 3-phase, 50 hertz.

Microfilm sizes used are almost exclusively 16mm. and 35 mm. Demand for 70mm. and 105mm. film is limited. Silver halide-type film accounts for the bulk of the total film market.

The Swiss use the standard 105mm. x 148mm. microfiche frame size, containing 60, 90, and 120 document-page images. Microfiche is still not widely used in Switzerland.

The most common reduction ratios are 24:1 for letter-size or legal-size documents; 30:1 for large engineering drawings, and 21:1 and 15:1 for smaller drawings.

A loan copy of basic research report "Micrographics—Switzerland." DIB 73-03-508, upon which this Export Market Digest is based, may be obtained from the Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

United Kingdom

Britain is one of the world's largest users of micrographics technology, outranked only by the United States and Germany.

Sales of micrographics products in the United Kingdom have grown dramatically since the late 1960's, and projections indicate that this trend will continue well into the 1970's (see figure 1).

U.S. suppliers are far ahead of all competition in the United Kingdom and will be the major beneficiaries of growth in this market through at least 1976.

Highlights

► Sales of micrographics equipment and supplies in the United Kingdom, which totaled \$21.3 million in 1972, are forecast to more than double by 1976 to \$45.5 million.

► Imports in 1976 are expected to reach \$24.1 million, a gain of almost 120% over the 1972 figure of \$11.1 million.

► U.S. suppliers, whose sales of micrographics equipment to the United Kingdom in 1971 amounted to about \$5 million, are expected to increase their sales to almost \$13 million in 1976.

► Demand for readers is expected to soar to \$13 million by 1976 from \$5.5 million in 1972.

► U.K. expenditures for computer-output-microfilm (COM) devices should climb 150% by 1976 to \$4.5 million from the 1972 level of \$1.8 million.

British Market to Double by 1976

The 1972 market for micrographics equipment and supplies in the United Kingdom reached \$21.3 million, a 250% increase over the \$8.5 million British market in 1968 (see table 1). Trade sources predict that the market will grow at an average annual rate of 21%, reaching \$45.5 million in 1976.

Equipment in 1972 accounted for almost 59% of the total micrographics market, or \$12.8 million (see table 2). Supplies made up the remaining \$8.5 million. In 1976, equipment sales should reach \$28 million, or 62% of the total market, while supplies are expected to reach \$17.5 million, or 38%.

Imports account for a significant portion of the United Kingdom's total micrographics market; in 1968, they accounted for \$4.3 million, or 51% of the country's total micrographics purchases. This figure in 1972 jumped to \$11.1 million, or 52% of the total. Imports will continue to make up about half of Britain's total micrographics market through at least 1976. Based on a predicted 22% average annual growth rate, imports are expected to reach \$24.3 million in 1976.

Equipment accounted for 81%, or \$3.5 million, of the 1968 micrographics import market; supplies made up the remaining 19%, or \$800,000. The value of imported micrographics equipment in 1971 reached \$8.1 million, or 84% of the import market. Supplies accounted for \$1.5 million, or 16% of total 1971 imports. It is anticipated that in 1976 equipment imports will surpass the \$19 million mark, and imports of supplies will reach \$5 million.

The United States is the principal supplier of micrographics products to the United Kingdom. U.S. manufacturers accounted for 52% of 1971 British imports of the product category with sales of \$5 million (see table 3).

Trade sources indicate that the British will continue to rely on the United States to meet their needs for advanced micrographics products, with the U.S. share of imports expected to reach nearly \$13 million in 1976. Germany, the only other major supplier of micrographics products to the United Kingdom, held 16% of the import market in 1971.

Specific Sales Opportunities

The British are expected to buy about \$75 million worth of imported micrographics products during the period 1972-76. American manufacturers should make more than half of these sales. A recent market research study conducted in the United Kingdom for the U.S. Department of Commerce identified the following micrographics products as offering U.S. exporters the best sales opportunities:

- 16mm. microfiche readers
- 16mm. roll film readers
- Small-capacity COM recorders
- 16mm. cameras
- Electrostatic reader/printers

Readers.—Knowledgeable British trade sources predict that readers will have the highest sales potential of all micrographics products. Demand will be strongest for 16mm. roll film and microfiche readers. Reader sales in 1972 amounted to \$5.5 million, triple the 1968 level of \$1.8 million. The market for readers is forecast to grow at an annual rate of 24% to \$13 million in 1976. The high demand for roll film and microfiche readers will result from the increased use of large-

scale microfilm systems by banks, government agencies, insurance companies, and large industries.

Reader/printers.—With modern electrostatic reader/printers gaining popularity in Britain, demand is expected to rise 14% annually between 1972 and 1976, going from \$2.3 million to \$4 million. The 1972 figure was up \$900,000 from the 1968 level of \$1.4 million. The speed and simple operation of electrostatic reader/printers should lead to their widespread acceptance in the U.K. market.

Cameras.—Growing at an average annual rate of 18% between 1972 and 1976, camera sales should surpass the \$4 million mark in 1976. This figure is double the \$2 million reached in 1972 and more than four times the 1968 level of \$950,000. The greatest demand will be for 16mm. cameras, with sales of this type alone expected in 1976 to reach more than \$3 million, or about 75% of the projected camera market for that year.

The predicted strong surge in demand for large cameras in the United Kingdom relates directly to an expected rapid increase in number of systems installations and to the expansion of existing installations through purchase of add-on equipment. Demand for lower-priced cameras also is expected to accelerate as increasing attention by smaller firms is directed to the advantages of micrographics techniques over traditional information systems and procedures.

Sales of 35mm. cameras should reach \$800,000 in 1976, up sharply from the \$550,000 sales level in 1972 and more than double the \$350,000 figure registered in 1968. Almost all of Britain's 35mm. microfilm cameras are imported from the United States. Sales of step-and-repeat cameras should show moderate growth, reaching \$150,000 by 1976.

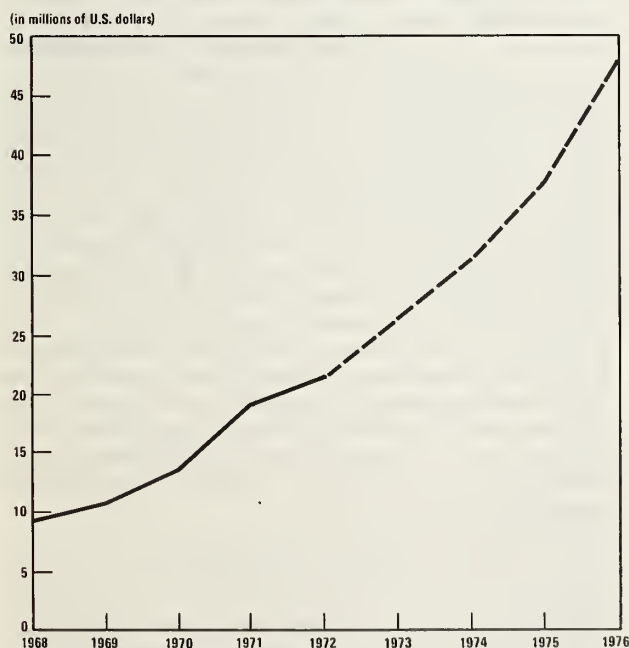
Computer-output-microfilm (COM) devices.—Britain's COM market has undergone a dramatic growth period, increasing more than threefold in 1972 to \$1.8 million from the 1968 level of \$500,000. Sales of \$4.5 million are expected by 1976, representing an average annual growth rate of 26% between 1972 and 1976. The United Kingdom now has about 35 COM installations. By 1976, the number is expected to grow to more than 100. Banks, insurance companies, large industrial firms, service centers, and government agencies are expected to be the best customers for COM devices during the next 4 years. Trade sources note that future sales will be led by small-capacity COM equipment. The only COM manufacturer in the United Kingdom is Ferranti, Ltd., which produces one type of graphics COM device.

Duplicators.—The anticipated strong rise in COM sales should stimulate demand for duplicators. British purchases of duplicators are expected to reach \$500,000 by 1976, compared with \$400,000 in 1972.

Automatic retrieval devices.—It is expected that sales of automatic retrieval devices will experience an average annual growth of about 25% in the years immediately ahead. Based on this forecast, sales should rise from a value of \$250,000 in 1972 to \$600,000 in 1976.

Processors.—British consumption of processors is expected to show an average annual growth of 18%

Figure 1.—United Kingdom: Size of Market For Micrographics Equipment and Supplies, 1968-72, and Projected 1976



Note: Size of market equals production plus imports minus exports.
Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study.
Values are based on U.K. trade estimates and BIC analyses.

Table 1.—United Kingdom: Size of market for micrographics equipment and supplies, 1968-72, and projected 1976
(in millions of U.S. dollars)

	1968	1969	1970	1971	1972	1976
Production	7.4	10.6	13.3	17.6	21.5	44.9
Imports	4.3	5.3	6.5	9.6	11.1	24.3
Exports	3.3	5.3	6.4	9.2	11.3	23.7
Size of market	8.4	10.6	13.4	18.0	21.3	45.5

Note: Size of market equals production plus imports minus exports.

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on U.K. trade estimates and BIC analyses.

through at least 1976. This rate of growth should result in an expansion of the market for processors in 1976 to \$200,000, or double the 1972 total.

Supplies.—U.K. purchases of micrographics supplies rose to \$8.5 million in 1972 from \$4 million in 1968. Much of this dramatic rise is attributable to the rapid expansion of Britain's COM user base. By 1976, the level of expenditures for micrographics supplies is expected to climb to over \$17 million, or a 38% share of the total micrographics market.

Film comprises a major share of the supplies market. Diazo film should show a much higher rate of growth than other types of film, largely because of the projected increases in the use of COM recorders. Sales of electrostatic paper should also grow significantly as electrostatic reader/printers replace older equipment based on silver technology.

Microfilm services and micropublishing.—The U.K. microfilm services market increased threefold between 1968 and 1972, going from \$800,000 to \$2.4 million. In 1968, about 75% (\$600,000) of total service bureau sales were made by conventional microfilm service bureaus and the remaining 25% (\$200,000) by COM service bureaus. The 1972 services market was evenly shared by conventional microfilm and COM service bureaus, each showing \$1.2 million in sales. Based on a predicted growth rate of about 15% annually, the market for microfilm conversion services is expected to reach \$4 million in 1976. Of this figure, it is estimated that COM service bureaus will account for \$2.3 million and conventional service bureaus for the remaining \$1.7 million.

Revenues generated by micropublishing houses grew from \$100,000 in 1969 to \$1.4 million in 1972. Micropublishing sales are expected to continue their strong rise at an annual rate of 25%, reaching a projected level of about \$3.3 million in 1976.

Strong Growth Market

The most important users of micrographics equipment and supplies in the United Kingdom are British manufacturing industries, especially the automotive industry. Industrial corporations account for about 35% of the country's total micrographics market (see table 4).

Commercial enterprises, led by banks and insurance companies, rank second among Britain's prime user groups, accounting for 25% of total micrographics products purchases. Government agencies represent the third largest segment of the U.K. micrographics market, accounting for 20% of consumption. The remaining

20% of the market is accounted for by public utilities, airlines, libraries, educational institutions, hospitals, and various gambling enterprises.

Indications are that all these principal user sectors will continue to be major factors in market demand during the 1970's.

Industrial.—Modernization of existing information systems by British manufacturing industries is generating a rapid rise in demand for advanced U.S. micrographics products. Private industry in 1972 spent \$7.4 million for micrographics products. This sector's 1976 micrographics products requirements, as projected, will be about \$16 million. Although the emphasis among industrial users of micrographics equipment is toward engineering drawing and archival applications, active business applications are expected to become widespread in the years immediately ahead.

Automotive manufacturers represent the largest single user group of micrographics products in the United Kingdom. The country's largest automotive firm is The British Leyland Motor Corp., Ltd. However, Ford, Vauxhall, Chrysler, Mercedes-Benz, Volvo, Volkswagen, and Toyota also have large manufacturing plants in the United Kingdom.

The British Leyland Motor Corp., Ltd. (BLMC) is one of the most progressive users of micrographics equipment in the United Kingdom. BLMC employs the NCR PCMI ultramicrofiche (UMF) system to reproduce on microfiche its parts and service catalogs.

This advanced microform catalog system has enabled BLMC to replace the conventional looseleaf parts and service catalogs with microfiche catalogs. This means that BLMC's dealers receive entirely new parts and service catalogs periodically, eliminating the need for time-consuming page updating. All of BLMC's 4,000 British dealers are equipped with PCMI microfiche readers for fast information retrieval.

Ford also has adopted the NCR high-reduction PCMI microfilm catalog system. This system replaces 10,000 catalog pages on cars and trucks. Some 1,500 Ford dealers in the United Kingdom use PCMI microfiche readers for instant access to vital catalog data. Ford also now uses a 35mm. system for microfilming engineering drawings.

Vauxhall has adopted a micrographics system designed to assist dealers in monitoring their stocks of spare parts. The system, called SCOOP (Stock Control Operating and Ordering Procedures), combines microfilm and a teletype link. The dealer transmits his daily stock transactions to Vauxhall's central computer center via teletype tape. At the end of the week, he receives

Table 2.—United Kingdom: Sales of product category by principal subcategories, 1972 and projected 1976
(in millions of U.S. dollars)

Micrographics equipment	1972	1976
Readers	5.5	13.0
Reader/printers	2.3	3.9
Cameras	2.0	4.1
Computer-output-microfilm (COM) devices	1.8	4.5
Duplicators	0.4	0.5
Automatic retrieval devices	0.3	0.6
Processors	0.1	0.2
Other equipment	0.4	1.2
Total	12.8	28.0
Micrographics supplies	8.5	17.5
Grand Total	21.3	45.5

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on U.K. trade estimates and BIC analyses.

a cartridge of 16mm. COM-produced film which gives him a fast reference to details on current stocks, bin locations, parts numbers, and prices.

Mercedes-Benz converts its service and parts catalogs to 16mm. microfilm cassettes for distribution to its dealers. Twice a year, the catalogs are updated and new cassettes are prepared and distributed to dealers.

Toyota also has introduced micrographics techniques for microcopying its parts and service catalogs. Volvo and Volkswagen are expected soon to follow suit.

Another significant user of micrographics equipment is Imperial Chemical Industries, Ltd. (ICI), the largest chemical and synthetic fibers firm in the United Kingdom. ICI utilizes its micrographics facilities for both archival and active applications. Its equipment is used primarily for microfilming customer records, engineering drawings, technical data and reports, patents, and other important documentation.

ICI operates a 35mm. system consisting of one Kodak planetary camera and a number of readers supplied by Kodak and 3M. It also has a 70mm. system comprising Kodak cameras (planetary and rotary), 3M cameras, and a number of readers acquired from Kodak and Dasa. ICI's in-house facilities also include a microfilm jacket system. Its present expansion plans include the acquisition of a second 35mm. system. The services of a COM service bureau are employed by ICI for recording and updating of share portfolio accounts.

Other important users of micrographics equipment and systems in the industrial sector are:

Marconi Co., Ltd., the well known telecommunications firm, uses a 35mm. aperture card system for microfilming engineering drawings and a 16mm. roll film system for handling customer account records.

The Plessey Co., an electronic parts manufacturer, uses a 35mm. aperture card system for microfilming engineering drawings. Two other systems, one 8mm. and one 16mm., are utilized to record other documents for archival and security purposes. Plessey is equipped with Kodak planetary processor cameras, Caps microfilm readers, reader/printers, one Ozalid 3020 printer, and one Rank Xerox 1824 printer. It is considering the use

of COM equipment to more efficiently and economically handle its ever-expanding parts lists, invoices, and other day-to-day commercial data.

The Hawker Siddeley Group, with sales of \$1.3 billion, is a leading manufacturer of aircraft, aerospace and electrical equipment, and diesel engines. It employs a 35mm. aperture card system for engineering drawing applications, a 16mm. system for financial records, and a 16mm. microfilm jacket system for technical reports and statistical information. Its equipment comprises one 35mm. planetary Microbox camera, Kodak and 3M 16mm. cameras, Caps and 3M readers, and 3M reader/printers. Hawker Siddeley plans soon to convert its aircraft maintenance manuals to 16mm. microfilm cassettes. It is also studying possible COM applications in its operations.

John Players and Sons, a cigarette manufacturer, has installed a 16mm. microfilm system to store and retrieve sales records. This firm uses a rotary camera for microfilming of continuous invoice forms generated by computer print-out operation. Automatic reader/printers are employed to retrieve and produce hard copy of recorded invoices.

Commercial.—Outlays for micrographics products in 1972 by the commercial sector accounted for 25%, or \$5.3 million, of the total market. If commercial enterprises maintain their present market share, their aggregate annual purchases of micrographics products will exceed \$11 million in 1976.

Banks and insurance companies are the leading users of micrographics equipment in this segment of the market. The overall utilization of microcopying in U.K. banking shows a wide range of applications, including daily microfilming of checks, postal checks, payment orders, account statements, and withdrawal and deposit tickets. Expenditures by banks for COM systems should rise as increasing reliance is placed on advanced technologies to handle and control their growing volume of daily transactions. Trade sources predict that banks will be operating as many as 30 COM recorders by 1976.

Britain's six major groups of clearing, deposit, or commercial banks are important users of micrographics equipment. Ranked by assets, they are the Barclays Group (\$15.3 billion), the National Westminster Group (\$14.6 billion), the Lloyds Group (\$9.8 billion), the Midland Group (\$9.7 billion), the National and Commercial Group (\$2.8 billion), and the Bank of Scotland (\$1.4 billion). The member banks comprising the six groups have a total of more than 13,000 branches spread throughout the United Kingdom.

The Barclays Group, with 3,500 branches, uses microfilm for virtually all aspects of its daily business activities. Some 150 Kodak cameras are installed in its main branches.

The National Westminster Group, with 3,600 branches, microfilms all checks, ledgers, and withdrawal and deposit records. Its facilities include 400 Kodak portable cameras and 100 Kodak Recordak Reliant 600 cameras. In addition, the National Westminster Group has two DatagraphiX 4440 COM recorders. It also operates a commercial COM service bureau, Centre-File, Ltd., equipped with a DatagraphiX 4440 COM recorder.

Table 3.—United Kingdom: Value and market share of imports of micrographics equipment and supplies by country or origin, 1968-71

(in millions of U.S. dollars)

Country	1968		1969		1970		1971	
	Value	Market share percent	Value	Market share percent	Value	Market share percent	Value	Market share percent
United States	2.4	55	2.7	50	3.5	54	5.0	52
Germany	0.5	12	0.7	13	1.0	16	1.5	16
Others	1.4	33	1.9	37	2.0	30	3.1	32
Total	4.3	100	5.3	100	6.5	100	9.6	100

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on U.K. trade estimates and BIC analyses.

National Westminster's COM recorders are used to microfilm customer account statements as well as the more than one million checks that go through its clearing system daily. About nine million feet of microfilm is used annually by National Westminster in its micrographics operations. Future expansion plans include the installation of a microfilm jacket system for client files and two additional COM recorders.

The Midland Group, with 2,600 branches, and the Lloyds Group, with 2,100 branches, both make extensive use of micrographics equipment for a wide range of banking applications.

British merchant banks (investment banks) are also good potential customers for the product category. Hill Samuel has adopted the use of micrographics equipment for active applications. This bank maintains a DatagraphiX 4440 COM recorder, used primarily for share registration work. It recently ordered a second COM unit, a Quantor 100. Hill Samuel also operates the Lowdnes Ajax COM service bureau, which has a 3M-EBR COM system.

Trade sources believe that many other merchant banks will follow the lead set by Hill Samuel and enter the COM field. Merchant banks such as N. M. Rothschild, Shroders, Hambros, Keyser Ullmann, Morgan Grenfell, and Lazards will probably acquire a total of 10 to 12 COM recorders by 1976.

The British insurance industry represents a strong potential market for micrographics products. There are several hundred insurance companies in the United Kingdom; an increasing number of these companies are turning to micrographics technology as a solution to their ever-increasing data handling problems.

The Legal and General Assurance Society, one of Britain's largest insurance companies, uses a 16mm. micrographics system for archival applications. This company introduced active applications on an experimental basis in 1972 when it hired a COM service bureau to create a microfilm listing of policyholders' names, birth dates, and policy numbers. This index is updated each week. The Legal and General Assurance Society is considering purchase of a COM recorder to prepare policy records in microfiche form for distribution to all branch offices.

Another large insurance company, the Norwich Union Insurance Group, uses a 16mm. microfilm system for checks and correspondence. It also has a small micro-

film jacket system and is considering purchase of a COM recorder in the near future.

By the late 1970's, trade sources estimate that British insurance companies will be using as many as 20 COM devices. Some of the major insurance companies that are prime prospects for COM recorders and other types of micrographics products include Lloyds of London; The Prudential Assurance Co.; Guardian Royal Exchange Assurance; Pearl Assurance Co.; Commercial Union Assurance Co.; Phoenix Assurance Co.; Cornhill Assurance Co.; and the Standard Life Assurance Co.

Government.—The British Government spent over \$4 million on micrographics equipment and supplies in 1972, accounting for 20% of the total micrographics market. Trade sources predict that government purchases of micrographics equipment and supplies will experience rapid growth through 1967, advancing as much as 40% each year. The best sales potential is seen for COM devices and peripheral equipment, especially readers.

About 75% of all government departments use microfilm in one form or another. They use 16mm. and 35mm. roll film, aperture cards, and microfiche. Most purchases are made centrally by Her Majesty's Stationery Office (HMSO), London. A small government unit called the Civil Service Department has been formed to act as an internal consulting office on micrographics products for various government agencies. The department is usually contacted before the government purchases any micrographics products.

Her Majesty's Customs & Excise department is planning extensive use of microfilm to record tax returns submitted after the April 1973 introduction of Britain's value added tax. These returns will be filmed by fast flow cameras with a sequential numbering attachment. The microfilms, in cassette form, will be used in conjunction with a computer system for checking returns. Equipment for this department will include six Kodak Recordak Reliant 600 cameras and five Kodak reader/printers.

The Department of the Environment plans to use microfilm to create a centralized file of information on motor vehicle registrations and drivers' licenses. Plans call for the use of 20 Kodak cameras with sequential number input and 80 reader/printers with push-button retrieval systems. The reader/printers will be purchased in the near future. Within 2 years, the Depart-

Table 4.—United Kingdom: Value and market share of micrographics consumption by principal user sectors, 1972

(in millions of U.S. dollars)		
Sector	1972	Percent
Industrial	7.4	35
Commercial	5.3	25
Government	4.3	20
Other (including educational institutions, hospitals, service centers, libraries, public utilities, airlines, and gambling enterprises)	4.3	20
Total	21.3	100

Source: U.S. Department of Commerce, Bureau of International Commerce (BIC) market research study. Values are based on U.K. trade estimates and BIC analyses.

ment of the Environment is expected to use an off-line COM system for rapid access to file information.

The Department of Employment has found that microfilm offers it the opportunity to prepare a bi-weekly listing of all professional and executive employment vacancies in the United Kingdom. Lists of vacancies are prepared on roll film cassettes by a COM service bureau and then distributed to 200 of the Department's largest field offices.

Plans call for the use of microfilm in the Department's entire southwest area, which includes all of London and its suburbs. All regional offices will be linked to a computer in Reading and will transmit daily listings of filled positions and new vacancies to the head office. The lists then will be taken to a COM service bureau which will produce 700 master microfiche, duplicates of which will be distributed to all the Department's field offices. Each of these offices will have Bell & Howell Micro-Design readers.

The Royal Air Force plans to rely on micropublishing to prepare its general supplies catalog. The catalog, which contains 12,000 pages and about 50,000 items, will be updated monthly and completely revised each year. HMSO has invited bids from micropublishing houses to prepare the cassettes. Initial steps are also being taken to purchase 1,300 cassette readers.

Britain's Department of Defense has formed a Joint Services Technical Publications committee to study the use of microfilm. The Royal Navy is considering the use of microfilm to publish its technical handbooks. The Royal Air Force operates a DatagraphiX 4460 COM system.

The Public Records Office microfilms all of its documents that are in the public domain, utilizing 16mm. and 35mm. microfilm systems. Government librarians and historians use the microfilmed documents for their research, and microfilm duplicates are available to libraries and other institutions. The Public Records Office has 20 cameras, including Kodak's model MRD-2, Kodak's Starfile, and various Bell & Howell models. Most of its cameras are large planetary models.

The Department of Health and Social Security, Newcastle, puts pension records on roll-type microfilm, employing a DatagraphiX 4440 COM recorder. In addition,

it uses 20 Kodak Recordak Reliant microfilmers, and 100 Caps reader/printers.

The Patent Office and Industrial Property and Copyright Department records about two million patent applications on aperture cards each year. The cards are retrieved manually. Equipment used by this Office includes several Kodak cameras, one Kodak Prostar film processor, and one Ozalid 34 printer.

The United Kingdom's Post Office Corporation (POC) stands out as an important potential user of microfilm products. The POC is an independent corporation with a great degree of autonomy. It purchases its equipment independently of HMSO. The POC now uses a 35mm. aperture card system for engineering drawings. Plans call for a microfilm system to register the postal system's payment orders, checks, and credit slips.

The telephone company plans to install an automatic microfilm information system to speed and automate the handling of telephone directory inquiries. Such a system is in use at the telephone exchange in Manchester. Implementation of the new system will involve the acquisition of some 2,000 microfiche readers. The telephone company also plans to add 600 to 700 microfiche readers and 60 to 70 microfiche reader/printers to implement an accounts payable system based on its existing DatagraphiX COM installation.

Other large-scale government micrographics users which have COM recorders include the United Kingdom Meteorological Office and the Atomic Energy Authority (each equipped with a Calcomp COM), the Department of National Savings (Kodak KOM-90), the Royal Air Force at Hendon (DatagraphiX 4460), and the United Kingdom Atomic Weapons Laboratory. The Department of Trade and Industry, the Technical Reports Center, and the Police Records Department also use various microfilm systems in their information handling operations.

Hospitals.—British hospitals are among micrographics prospects whose use of such equipment is still in an early stage. As in other European countries, budgetary constraints are the main factor inhibiting the development of this market sector. New Charing Cross Hospital and Aylesbury Hospital in Hammersmith, both recently constructed, use a jacket system for microfilming patient records. The Royal National Orthopedic Hospital and St. Bartholomew's Hospital store inactive records on microfilm.

Libraries.—Most of Britain's large libraries preserve back issues of journals and newspapers on microfilm. Their present micrographics equipment resources are meager, limited primarily to readers. The number of British libraries is expected to be reduced substantially in the near future as 130 large centralized libraries replace 2,500 smaller ones. This reorganization could lead to the introduction of new book-lending and other library applications based on micrographics technology.

Public utilities.—British utility companies are expected to enter a period of high micrographics investment, with particular interest to be shown in COM recorders. The South Wales Electricity Board has a large micrographics installation based on a Memorex

COM recorder. The Eastern Electricity Board is using a Pertec 3700 COM system in its data handling operations. The Eastern Electricity Board (EEB) in Ipswich plans to install shortly a Pertec COM system to be used for recording on microfiche some 40,000 customer account statements issued each day. EEB will send microfiche duplicates to all its branches daily, enabling them to provide a prompt response to customer inquiries. EEB also is considering the use of COM for accounting, payroll, and stock control applications.

The British Gas Corporation (BGC), another major user of the product category, may soon expand its micrographics operations. Its present facilities include a microfilm jacket system and a microfiche system, both employed in the microfilming of technical notes produced by its research and development laboratories. BGC maintains a third micrographics system for recording checks and invoices on 16mm. roll film.

In addition, BGC is micropublishing catalogs listing parts of commercial gas appliances and has purchased 1,600 readers for dealers who are to receive the catalogs. Half of these readers are Mercury models produced by Caps Microfilm, Ltd., and the remainder are manually operated readers manufactured by Computer Instrumentation, Ltd.

Airlines.—British European Airways (BEA), with \$3.2 billion in revenues in 1971, employs a 35mm. aperture card system for microfilming engineering drawings. The system includes an Agfa-Gevaert planetary camera. BEA's maintenance manuals and parts catalogs are microfilmed on cartridge roll film and distributed to its line stations. All of BEA's line stations are equipped with reader/printers. British Overseas Airways Corp. (BOAC) has established a micrographics information system based on a DatagraphiX 4360 COM recorder.

Gambling enterprises.—Wagering on soccer games is popular in the United Kingdom. Businessmen who operate legalized soccer pools place wagering records on microfilm to guard against fraud. Coupons are filmed before each game, and when an individual claims his winnings his coupon is matched with microfilmed records. Littlewoods Pools, the largest such enterprise, has just begun using microfilm in its operations. Empire Pools, Zetter Pools, Coops Pools, and Soccer Pools also use microfilm. Vernon Pools uses 40 Bell & Howell cameras (mostly Director models) and a Bell & Howell microfilm jacket system.

In addition to the soccer pools, there are about 18,000 licensed betting shops in the United Kingdom, 14,000 of which use microfilm cameras. These cameras record the date and time at which the document was filmed, as well as the betting slip itself. Ladbroke, the largest betting shop in Britain, with about 700 shops, uses Agfa-Gevaert Copex OTC multibet press-down cameras. Windsor has about 200 shops and uses 170 Agfa-Gevaert Copex OTC cameras, while Hill, with 500 shops, uses both Agfa-Gevaert Copex OTC and Photo Bet cameras.

Service centers.—Six COM service centers and 40 conventional microfilm service centers operate in the United Kingdom. Most of the conventional centers are relatively small operations concentrating on 35mm.

engineering drawing conversion services. The largest of the COM centers is Singer Information Services Co., Ltd., London, which uses a DatagraphiX 4440. Kodak and NCR are the two micrographics equipment manufacturers which operate their own COM service centers. The remaining COM service bureaus are Centre-File, Ltd., Microgen, Ltd., and Lowdnes Ajax Systems. At least two or three COM service bureaus are expected to open in the United Kingdom within the next several years.

Legal Aspects of Microfilm

Although the legal status of microfilm documentation in Great Britain has not been clearly defined by a court test case, its validity as a legal document is partially defined by the Civil Evidence Act of 1968. According to this Act, a legal document is "any film, negative, tape, or other device in which one or more visual images are embodied so as to be capable (as aforesaid) of being reproduced therefrom; film includes a microfilm," Civil Evidence Act, 1968, 10, (1) Pages 11 & 12. The act also indicates that to be a "document," microfilm must be a part of the normal business record system. If the document is to be used as evidence, it is desirable that the nature of the document and date of filming be indicated. It should be certified that the original document was not altered in any way.

According to British law, certain papers must be retained as originals. These include documents of title, Articles of Association, and certain other papers specifically mentioned in the Companies Act of 1968. It is unlikely that microfilm copies of these documents would be admissible as evidence in British courts even if they were certified.

Competitive Environment

The U.S. share of micrographics imports in the United Kingdom remained at more than 50% from 1968 to 1971, totaling \$5 million in 1971. Germany was the only major foreign supplier in 1971, accounting for 16% of imports with sales of \$1.5 million.

British production of micrographics products rose from \$7.4 million in 1968 to \$21.5 million in 1972 (see table 1.) About 50% of local production in 1972 was exported, and this trend is expected to continue through at least 1976. The British are expected in 1976 to produce almost \$45 million in micrographics equipment and supplies.

About 22 micrographics firms are active in the U.K. market, including 10 U.S. companies. Kodak has established itself as a leading supplier in the expanding U.K. micrographics market, especially in the area of 16mm. equipment. Great inroads in the British market have also been made by 3M Co., which is especially strong in sales of 16mm. and 35mm. readers and reader/printers. The Bell & Howell Co. ranks third in terms of sales volume, with banks, soccer pools, and insurance companies as its best customers. NCR is recognized as the leader in the U.K. micropublishing field. It has made a strong impact in the U.K. market through sales of its PCMI ultrafiche systems.

Other U.S. manufacturers who have established positions in the United Kingdom are Rank Xerox, Data-

graphiX, Memorex, Calcomp, GAF, Remington Rand, and Seaco.

The British import tariff system is based on the Brussel's Tariff Nomenclature (BTN) classification. Duties on imported goods are in most cases levied on an ad valorem, c.i.f. (cost, insurance and freight) basis. Current tariff rates applicable to imports of micrographics equipment and supplies range between 7.5 and 20%. Information on U.K. import duties applicable to specific micrographics products may be obtained from the Bureau of International Commerce, Domestic and International Business Administration, U.S. Department of Commerce, Washington, D.C. 20230.

The United Kingdom joined the European Economic Community (EEC) on January 1, 1973. The terms of Britain's accession to the EEC call for a 5-year transition period to implement the provisions of The Treaty of Accession. For industrial products, tariffs between the old member states and the United Kingdom will be reduced in five equal steps of 20% between April 1, 1973, and July 1, 1977. (The three intermediate cuts will be made on January 1 of 1974, 1975, and 1976.)

Between January 1, 1974, and July 1, 1977, the United Kingdom will gradually adopt the EEC's Common External Tariff (CXT) in place of its own tariffs. Forty percent of the alignment will be made on January 1, 1974, with 20% each on January 1, 1975 and 1976 and July 1, 1977.

Further detailed information about Britain's import duties and trade regulations is available in the U.S. Department of Commerce publication, Foreign Trade Regulations of the United Kingdom, OBR 72-066, November 1972.

Sales Development

Since leasing offers no tax advantage to British customers, most micrographics equipment is purchased. Terms of sale usually require payment within 30 days after the equipment has been delivered. Payment terms offered to larger customers and government agencies tend to be more liberal; some of these customers receive quantity discounts as well as extended payment terms.

Customarily, markups by foreign manufacturers range from 25 to 35%. Markups by British suppliers range from 20 to 30%. On supplies, markups may be slightly higher. Duties on leased equipment are assessed on the c.i.f. value of the equipment at the port of entry.

Typical warranties extend for 6 months to 1 year for parts and labor, provided that the equipment has been used with recommended films and supplies. Installation costs are usually included in the sales or lease price of the equipment. Maintenance and service costs are normally covered by a separate yearly contract. Charges for service contracts range from 3 to 5% of the value of the equipment installed. If the equipment is leased, maintenance and service charges are included as part of the rental price.

The most important British trade fairs in the micrographics field are Microforum International, to be held at London's Hilton Hotel in June 1974, and the

Business Efficiency Exhibition, scheduled for October 1973 in Olympia Hall, London. Both fairs are organized by the Business Equipment Trades Association (BETA), 109 Kingsway, London WC 2. Foreign participation is encouraged.

Newspapers and journals considered good vehicles for regular display and prestige advertising of micrographics products are: *Business Systems & Equipment*, *Financial Times*, *The Economist*, *Office Equipment News*, *Sunday Times*, and *Reproduction*. In addition, British decision makers read such U.S. publications as *Datamation* and the *International Micrographics Congress Journal*.

Technical advice and publications dealing with all phases of micrographics are available for documentation from the National Reprographic Center (NRCd), located at Hatfield Polytechnic, College Lane, Herts. NRCd offers information covering the whole field of reprography, but focuses on micrographics systems and techniques. It is composed of a body independent of manufacturers and is administered by members of the faculty of Hatfield Polytechnic.

Technical Standards

Electric current characteristics throughout the United Kingdom are 220/250 volts, single-phase, 50 hertz, and 400/440 volts, 3-phase, 50 hertz. The 220/250 volt supply normally is used for light equipment where the maximum current demand does not exceed 13 amps. and 3 kilowatts. Over this loading, 3-phase, 4-wire connections are required.

Imported equipment should meet the standards of the British Standards Institute which are available from Her Majesty's Stationery Office, Atlantic House, Holborn Viaduct, London EC 1. Information on current standards and projected changes can also be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

The United Kingdom is shifting to the metric system, and all equipment should be adapted to this standard.

For micrographics applications in the United Kingdom, the International Standards Organization (ISO) standards are used more frequently than DIN standards.

The British use the standard 105mm. x 148mm. microfiche frame size, containing 60 and 98 document-page images.

The reduction ratio used in the United Kingdom for most documents is 24:1. For COM applications, the reduction ratios most commonly used are 42:1 and 21:1. For large engineering drawings, the one most often used is 30:1, while 21.1:1, 15:1, 10.6:1, and 7.5:1 are used for smaller drawings.

A loan copy of basic research report "Micrographics—The United Kingdom," DIB 73-03-503, upon which this Export Market Digest is based, may be obtained from the U.S. Department of Commerce, Bureau of International Commerce, Washington, D.C. 20230.

III. Supplementary Information for U.S. Exporters

FINANCING EXPORT SALES

The Export-Import Bank of the United States

Various export financing programs of the Export-Import Bank of the United States (Eximbank) are available to assist U.S. manufacturers and suppliers of micrographic equipment, and supplies. The available programs range from the Commercial Bank Exporter Guarantee Program and credit insurance offered by the Foreign Credit Insurance Association to the Cooperative Financing Facility.

In all cases, a cash payment of at least 10% of the contract price must be paid in U.S. dollars in the United States on or before delivery of the equipment. Under the bank guarantee and insurance programs, the balance must be evidenced by a promissory note or other acceptable obligation of the buyer providing for payments in U.S. dollars in the United States in approximately equal installments of principal payable not less frequently than semiannually. In rare cases annual installments will be considered. Under these same programs, the exporter is required to retain at least 10% of the financed portion for its own account and risk.

Under the Cooperative Financing Facility, Eximbank allocates a line of credit to an eligible Cooperating Institution to be disbursed to suppliers on approved transactions for purchasers in the country of the Cooperating Institution. Each transaction under the Facility shall be jointly financed through a disbursement of funds by Eximbank and the Cooperating Institution. Eximbank's portion of the funding will be repaid at the rate of 6% per annum on outstanding balances.

The proposed repayment terms under the above-mentioned programs must conform to those considered customary in international trade. Typical terms covering the sale of micrographics equipment and supplies to end-users are as shown in the following chart.

If the sale is being made to a foreign dealer or distributor for resale in the local market, a maximum repay-

<i>Contract Price</i>	<i>Credit Period</i>
Up to \$25,000	Up to 3 years
\$25,000 to \$150,000	4 years
Over \$150,000	5 years

ment period of 3 years is deemed appropriate, no matter what the contract price of the equipment.

The appropriate repayment term for the sale of supplies for use with the micrographics equipment would appear to be a maximum of 180 days. Normally, the only program available to cover sales on these short terms is the Foreign Credit Insurance Association's Short-Term Insurance Program. It should be noted, however, that FCIA will require the exporter to declare sufficient of its exports to result in a reasonable spread of risk.

Eximbank also has an Export Finance Counseling Service which offers advice and guidance on all Eximbank programs of financial assistance to suppliers and bankers, regardless of whether they have had previous experience in financing sales abroad or not.

Exporters who have encountered difficulty in obtaining financing for specific sales are requested to submit to Eximbank evidence of their efforts to obtain credit from the private financial institutions.

In the case of U.S. commercial banks and financial institutions, it is suggested that they contact Eximbank before declining an export application to assure fullest possible consideration of all alternative resources before the applicant loses a potential sale of U.S. goods or services abroad.

For additional information write to Arthur K. Obester, Project Officer, Export-Import Bank, Washington, D.C. 20571.

EXPORT CREDIT INSURANCE

The Foreign Credit Insurance Association

The Foreign Credit Insurance Association (FCIA), an association of some 50 stock and mutual insurance companies, with its partner the Export-Import Bank of the United States, has instituted two new export credit insurance programs. First, FCIA now offers a flexible "Master Policy" up to 5 years. Second, FCIA is continually pre-qualifying (PQ) credit limits for foreign buyers to speed the issuance of a policy. As of 1972, FCIA will have pre-qualified over 17,000 foreign buyers. The policyholder is insured against loss from failure to receive payment from the buyer because of either commercial or political reasons. In addition, the policyholder is normally able to arrange favorable financing of export receivables because of the security and collateral afforded by the insurance. FCIA insures all types of industrial, agricultural, and commercial products.

THE FOLLOWING PROCEDURES AND CONDITIONS APPLY TO ALL POLICIES:

1. Eligible applicants, who must agree to assume the uninsured portion of the credit risk, include not only manufacturers but also qualified export management companies and financial institutions (including commercial banks).
2. Application for a policy may be made through any insurance agent or broker or directly to the FCIA home office in New York, or to one of FCIA's regional offices listed below.
3. The insurance premium rates vary. They are based on length of the credit period required and an evaluation of the political stability and economic condition of the buyer's country. Individual policy conditions may also affect premium rates. Whenever practical, an average or composite rate will be offered to simplify paperwork and reporting procedures.
4. Commercial risks covered by the comprehensive policies are insolvency of the buyer or failure of the buyer to pay the amounts due within 6 months of due date. Losses due to the fault of the exporter are, of course, excluded. Depending upon the due date, political risks coverage relates to events of a governmental nature which cannot be controlled either by the buyer or by the seller, such as transfer delays in converting local currency payments into dollars, cancellation of im-

port or export license, expropriation or confiscation, and losses caused by war, revolution, or civil disturbance.

5. Claims may be filed directly with FCIA or through the exporter's insurance agent or broker.
6. All policies provide that coverage begins on date of shipment; however, pre-shipment coverage is available by special endorsement to protect against insolvency of the buyer and certain political happenings during the period of manufacture of specially fabricated products. Also, products on consignment abroad and sales from such stocks may be covered by special policy endorsement.
7. Exporters may obtain an advance commitment of insurance coverage from FCIA prior to receipt of a confirmed order, thus greatly enhancing the chances of closing a successful sale and assisting them in negotiating financing in advance.
8. Policy proceeds may be assigned to financial institutions on an overall policy basis, buyer-to-buyer, or even obligation-by-obligation, if two or more assignee institutions are involved. Special assignment agreements for qualified insurance will be considered under those policies which contain a deductible provision, thus protecting the assignee institution to the same extent as under a standard policy.
9. Coverage is available for sales to buyers in most friendly foreign countries. Specific requirements and conditions may vary depending upon the country of destination.

FCIA Offices

Home Office:	250 Broadway, New York, N.Y. 1007
Regional Offices:	100 N. LaSalle Street, Suite 810, Chicago, Illinois 60602 55 Public Square, Suite 1435, Cleveland, Ohio 44113 301 World Trade Building 1520 Texas Avenue Houston, Texas 77002

Regional Offices: 611 W. Sixth Street,
Suite 650,
Los Angeles, Cal. 90017
622 N. Cass Street,
Suite 200,
Milwaukee, Wisconsin 53202

Regional Offices: 1 Embarcadero Center,
San Francisco, California 94111
The Woodward Building,
15th and H Sts., N.W.
Suite 539,
Washington, D.C. 20005

TAX BENEFIT PROGRAM FOR U.S. EXPORTERS (DISC)

Exporters will want to become familiar with the provisions of the Revenue Act of 1971 (Public Law 92-178) which permit U.S. firms to establish Domestic International Sales Corporations (DISC's) entitled to a tax break on export income. Essentially, the DISC is a domestic corporation which meets certain minimal organizational requirements and limits itself almost exclusively to export sales activities. If the corporation derives at least 95% of its income from export sale, lease, or rental transactions, and 95% of its assets are export related, it can defer U.S. income tax on up to 50% of its export income. Tax-deferred retained earnings can be used to expand and promote the DISC's export business and may also be loaned to any domestic producer of export goods, including the DISC's parent company.

DISC's can be formed by manufacturers, non-manufacturers, and export groups. A DISC can function as a principal, buying and selling for its own account, or as a commission agent. It can be related to a manufacturing parent or can be an independent merchant or broker.

Special intercompany pricing rules on transactions between a DISC and a related supplier or manufacturer allow a larger profit to the DISC than would normally be the case under the usual arm's length pricing requirements of the Tax Code.

A corporation wishing to be treated as a DISC must file a statement of election (IRS Form 4876) with the Internal Revenue Service within 90 days preceding the beginning of its tax year, for a corporation already in existence, or within 90 days after the date of incorporation, if newly formed.

The rules for organizing and operating a DISC are comparatively simple. Many U.S. businesses, both large and small, should be able to avail themselves of the advantages of exporting through DISC's.

For information, write Foreign Business Practices Division, Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230, or phone (202) 967-4471.

COMMERCE CONTACTS FOR U.S. BUSINESS

Office of Field Operations

The 43 U.S. Department of Commerce District Offices listed below represent the Department in their respective localities and assist in carrying out the programs of the

Department. Under the direction of the Office of Field Operations, these District offices are staffed by experienced specialists prepared to help in the solution of business problems and assist in exporting.

ALBUQUERQUE, NEW MEXICO 87101
U.S. Courthouse—Room 316
Area Code 505 Tel. 843-2386

ANCHORAGE, ALASKA 99501
412 Hill Building
632 Sixth Avenue
Area Code 907 Tel. 272-6531

ATLANTA, GEORGIA 30309
Suite 523, 1401 Peachtree St., N.E.
Area Code 404 Tel. 526-6000

BALTIMORE, MARYLAND 21202
415 U.S. Customhouse
Gay and Lombard Streets
Area Code 301 Tel. 962-3560

BIRMINGHAM, ALABAMA 35205
Suite 200-201
908 South 20th Street
Area Code 205 Tel. 325-3327

BOSTON, MASSACHUSETTS 02116
10th Floor, 441 Stuart Street
Area Code 617 Tel. 223-2312

BUFFALO, NEW YORK 14202
910 Federal Building
111 West Huron Street
Area Code 716 Tel. 842-3208

CHARLESTON, SOUTH CAROLINA 29403
Federal Building, Suite 631
334 Meeting Street
Area Code 803 Tel. 577-4171

CHARLESTON, WEST VIRGINIA 25301
3000 New Federal Office Building
500 Quarrier Street
Area Code 304 Tel. 343-6181, Ext. 375

CHEYENNE, WYOMING 82001
6022 O'Mahoney Federal Center
2120 Capitol Avenue
Area Code 307 Tel. 778-2220, Ext. 2151

CHICAGO, ILLINOIS 60604
Room 1406
Mid-Continental Plaza Bldg.
55 E. Monroe Street

CINCINNATI, OHIO 45202
8028 Federal Office Building
550 Main Street
Area Code 513 Tel. 684-2944

CLEVELAND, OHIO 44114
Room 600, 666 Euclid Avenue
Area Code 216 Tel. 522-4750

DALLAS, TEXAS 75202
Room 3E7, 1100 Commerce Street
Area Code 214 Tel. 749-3287

DENVER, COLORADO 80202
Room 161, New Customhouse
19th and Stout Streets
Area Code 303 Tel. 837-3246

DES MOINES, IOWA 50309
609 Federal Building
210 Walnut Street
Area Code 515 Tel. 284-4222

DETROIT, MICHIGAN 48226
445 Federal Building
Area Code 313 Tel. 226-6088.

GREENSBORO, NORTH CAROLINA 27402
258 Federal Building
West Market Street, P.O. Box 1950
Area Code 919 Tel. 275-9111

HARTFORD, CONNECTICUT 06103
Room 610-B, Federal Office Building
450 Main Street
Area Code 203 Tel. 244-3530

HONOLULU, HAWAII 96813
286 Alexander Young Building
1015 Bishop Street
Area Code 808 Tel. 546-8694

HOUSTON, TEXAS 77002
1017 Old Federal Building
201 Fannin Street
Area Code 713 Tel. 226-4231

JACKSONVILLE, FLORIDA 32207
Suite 129
4080 Woodcock Drive
Area Code 904 Tel. 791-2796

KANSAS CITY, MISSOURI 64106
Room 1840, 601 East 12th Street
Area Code 816 Tel. 374-3141

LOS ANGELES, CALIFORNIA 90024
11201 Federal Building
11000 Wilshire Blvd.
Area Code 213 Tel. 824-7591

MEMPHIS, TENNESSEE 38103
Room 710, 147 Jefferson Avenue
Area Code 901 Tel. 534-3214

MIAMI, FLORIDA 33130
Room 821, City National Bank Building
25 West Flagler Street
Area Code 305 Tel. 350-5267

MILWAUKEE, WISCONSIN 53203
Straus Building
238 West Wisconsin Avenue
Area Code 414 Tel. 224-3473

MINNEAPOLIS, MINNESOTA 55401
306 Federal Building
110 South Fourth Street
Area Code 612 Tel. 725-2133

NEWARK, NEW JERSEY 07100
24 Commerce Street
Area Code 201 Tel. 645-6214

NEW ORLEANS, LOUISIANA 70130
909 Federal Office Building, South
610 South Street
Area Code 504 Tel. 527-6546

NEW YORK, NEW YORK 10007
41st Floor, Federal Office Building
26 Federal Plaza, Foley Square
Area Code 212 Tel. 264-0634

PHILADELPHIA, PENNSYLVANIA 19107
Jefferson Building
1015 Chestnut Street
Area Code 215 Tel. 597-2850

PHOENIX, ARIZONA 85004
508 Greater Arizona Savings Bldg.
112 North Central
Area Code 602 Tel. 261-3285

PITTSBURGH, PENNSYLVANIA 15222
431 Federal Building
1000 Liberty Avenue
Area Code 412 Tel. 644-2850

PORTLAND, OREGON 97205
Suite 501
921 S.W. Washington Street
Area Code 503 Tel. 221-3001

RENO, NEVADA 89502
2028 Federal Building
300 Booth Street
Area Code 702 Tel. 784-5203

RICHMOND, VIRGINIA 23240
8010 Federal Building
400 North 8th Street
Area Code 703 Tel. 782-2246

ST. LOUIS, MISSOURI 63103
2511 Federal Building
1520 Market Street
Area Code 314 Tel. 622-4243

SALT LAKE CITY, UTAH 84111
1201 Federal Building
125 South State Street
Area Code 801 Tel. 524-5116

SAN FRANCISCO, CALIFORNIA 94102
Federal Building, Box 36013
450 Golden Gate Avenue
Area Code 415 Tel. 556-5864

SAN JUAN, PUERTO RICO 00902
Room 100, Post Office Building
Phone: 723-4640

SAVANNAH, GEORGIA 31402
235 U.S. Courthouse & Post Office Building
125-29 Bull Street
Area Code 912 Tel. 232-4321

SEATTLE, WASHINGTON 98109
Rm. 702, Lake Union Bldg.
1700 Westlake Ave. N.
Area Code 206 Tel. 442-5615

U.S. Trade Centers Abroad

U.S. Trade Centers abroad provide U.S. manufacturers with a unique method of testing and selling key foreign markets through commercial showrooms, permanently established in central marketing areas where the potential for American products is continuous.

Frankfurt, Bockenheimer Landstrasse 2-4, Frankfurt am Main, Germany, Tel. 72-08-01

London, 57 St. James Street, London, S.W.1, England, Tel: Hyde Park 5921

Mexico City, 31 Liverpool, Mexico, D.F.5, Mexico, Tel: 528-5602

Milan, Via Gattamelata 5, 20149, Milan, Italy, Tel: 46-96-451

Paris, 123 Avenue Charles de Gaulle, 92 Neuilly, Paris, France, Tel: Anjou 7460.

Stockholm, Vasagatan, 11, Stockholm C. Sweden, Tel: 08/24-84-20

Sydney, 37 Pitt Street, Sydney, NSW, 2000, Australia, Tel: 241-1031

Tokyo, Tameike Tokyu Building, 1-14 Akasaka, 1-Chrome, Minato-ku, Tokyo, Tel: 583-7141

U.S. Regional Trade Development Centers Abroad

The Regional Trade Development Centers (RTDC) offer U.S. businessmen a program of trade promotion events specially designed to meet the marketing needs of developing countries. The RTDC's assist U.S. businessmen to achieve increased market exposure for their products and services.

Southeast Asia: Singapore, c/o American Embassy, 30 Hill Street (FPO San Francisco 96699)

South America: Buenos Aires, Argentina, 441 Quintana, Tel: 463211

Middle East: Beirut, Lebanon, American Embassy, Corniche at Rue Ain Mreisseh

U.S. Trade Development & Technical Information Office, ul. Wiejska 20, Warsaw, Poland.

Office of Export Control

Information on U.S. export controls may be obtained from Exporters Service Branch, Office of Export Control, U.S. Department of Commerce, Washington, D.C. 20230. Telephone: (202) 967-4811.

IV. Schedule of Events

Schedule of Promotional Events for Global Market Survey Micrographics Equipment and Supplies

The schedule of promotional events for 1973, 1974 and 1975 is intended to assist firms in developing individual global marketing plans by selecting the most appropriate activities for promoting their products in the 13 foreign countries covered in this Survey.

The Schedule provides a chronological listing, by country, covering the following types of promotional activities:

- **International Trade Fairs**—Privately sponsored, foreign managed international exhibitions in which U.S. firms may exhibit their products on an individual basis.
- **Conferences, Congresses, Seminars and Symposia**—Privately sponsored, international activities in which U.S. firms may participate on an individual basis. Some of these events are held in conjunction with international trade fairs; others are held independently.
- **U.S. Trade Center Shows**—U.S. Trade Centers, which provide year-round facilities for display and demonstration of U.S. products, hold seven to nine major products showings per year featuring displays by 25 to 35 U.S. firms.

Some of the promotional events listed feature micrographics equipment, while others are closely related to micrographics and may be highly effective promotional media for such products. Practically every event mentioned in this section is potentially an excellent exhibit for micrographics equipment and supplies.

The information was derived from market surveys and the U.S. Foreign Service. Events are arranged chronologically by country. Some may be subject to change without notice but at the time of publication were scheduled for the dates and locations shown unless listed as "(Proposed)".

Events sponsored by the U.S. Department of Commerce appear in boldface letters on the Schedule. Additional Commerce-sponsored activities, or those in which the Department participates, may be scheduled from time to time.

The Bureau of International Commerce provides direct export promotion and marketing assistance to U.S. companies, employing a variety of professional promotional techniques.

- **Specialized Product Shows** are held in eight permanent U.S. Trade Centers located in major business centers—London, Frankfurt, Milan, Stockholm, Sydney, Tokyo, Paris, and Mexico City.
- **U.S. Regional Trade Development Centers**—These Centers, located in Bangkok, Buenos Aires, and Beirut, are creating an integrated approach to business development. Proven techniques include training courses for local personnel, technical seminars to acquaint purchasers with the range and applications of American products, business conferences, catalog shows, tailored trade missions, and product exhibitions. Any combination of these flexible techniques may be used to meet the needs of both the developing markets and American businessmen.
- **"Between Show Promotions"**—During periods between major shows, individual U.S. firms, or their authorized representatives, are encouraged to use the above facilities to stage one-company product promotions or sales seminars.
- **Specialized U.S. Trade Missions**—The Bureau of International Commerce organizes and sponsors Trade Missions covering selected product themes based on available market research and Foreign Service recommendations, establishes the overseas itinerary, pays the Mission's operating expenses, and provides an Advance Officer and Mission Director.

For further information regarding Commerce events contact any one of the 43 Commerce District offices listed in Section III. Additional information on all other events may be obtained from the contact indicated in the Schedule of Events for the particular activity.

Global Market Survey Promotional Events Schedule—1973

Micrographics Equipment and Supplies

NAME OF SHOW AND LOCATION	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
AUSTRALIA												
COMPUTERS, BUSINESS EQUIPMENT & GRAPHIC ARTS. New Zealand. U.S. Trade Center, Sydney (off-site)										X		
BELGIUM												
INTERELECTRONIC SALON.** Palais du Centenaire, B-1020 Brussels. Biennial. Contact: Palais du Centenaire, B-1020 Brussels.											X	
CANADA												
INTERNATIONAL ELECTRICAL, ELECTRONICS CONFERENCE & EXPOSITION. Automotive Building, Exhibition Park, Toronto. Biennial. Contact: Southam Publishing Company, Grant Smedmore Ltd., 1450 Don Mills Road, Don Mills, Ontario.											X	
CANADIAN NATIONAL BUSINESS SHOW. Place Bonaventure, Montreal, Quebec. Annual. Contact: Southam Publishing Company, Grant Smedmore Ltd., 1450 Don Mills Road, Don Mills, Ontario.											X	
CANADIAN COMPUTER SHOW. Sheraton Four-Seasons Hotel, Toronto 2, Ontario. Annual. Contact: McLean-Hunter Shows, Industrial & Trade Shows Division, 481 University Ave., Toronto 2, Ontario.									X			
CANADIAN GRAPHIC ARTS SHOW. Industry Building, Exhibition Park, Toronto, Ontario. Triennial. Contact: McLean-Hunter Shows, Industrial & Trade Shows Division, 481 University Ave., Toronto 2, Ontario.											X	
CANADIAN EDUCATION SHOWPLACE. Exhibition Park, Toronto, Ontario. Annual. Contact: McLean-Hunter Shows, Industrial & Trade Shows Div., 481 University Ave., Toronto 2, Ontario.											X	
FRANCE												
INTERNATIONAL OFFICE MACHINES & DATA PROCESSING EXHIBITION (SICOB). CNIT-La Defense, Paris, Puteaux. Annual. Contact: Societe Civile Particuliere du Salon des Industries et du Commerce de Bureau, 6 Place de Valois, 75001 Paris.									X			
MICROGRAPHICS. U.S. Trade Center, Paris.												X

**Foreign participation through local agents.

NAME OF SHOW AND LOCATION	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
GERMANY												
ORGATECHNIK—EXHIBITION FOR ORGANIZATION & TECHNOLOGY IN OFFICE & WORKS. ¹ Cologne. Contact: H. E. Melsom, Cologne Int'l. Trade Fairs, Room 229, Abbey Hotel, Victoria St., London, S.W.1.											X	
BURO DATA—OFFICE EQUIPMENT EXHIBITION. Berlin. Annual. Contact: Berliner Ausstellungen, Eigenbetrieb von Berlin, Messedamm 22, 1000 Berlin 19.									X			
MODERN OFFICE—OFFICE EQUIPMENT EXHIBITION. Stuttgart. Annual. Contact: Stuttgarter Ausstellungs-GmbH Am Kochenhof 16 Postfach 990 Stuttgart 7000.												
SYSTEMS '73. Munich. Biennial. Contact: Messe und Ausstellungsgesellschaft MBH, Theresienhohe 13, 8000 Munchen 12.											X	
ITALY												
SMAU—INTERNATIONAL EXHIBITION FOR OFFICE EQUIPMENT. Fair Grounds, Milan. Annual. Contact. Associazione Nazionale Commercianti in Macchine E Forniture per Ufficio, Corso Venezia 47/49, 20121 Milan.									X			
GRAFITALIA. Milan Fair Grounds, Milan. ¹ Contact: ACIMGA, Lungo Po Antonelli 49, 1053 Torino.											X	
JAPAN												
BUSINESS SHOW. Harumi Fair Grounds, Tokyo. Semi-annual. Contact: Nippon Office Management Association, 4-1-3, Sendagaya, Shibuya-Ku, Tokyo.					X							
BUSINESS SHOW. Minato Fair Grounds, Osaka. Semi-annual. Contact: Nippon Office Management Association, 4-1-3, Sendagaya, Shibuya-Ku, Tokyo.									X			
JAPAN ELECTRONICS SHOW. Minato Fair Grounds, Osaka. Annual. Contact: Electronic Industries Association of Japan, c/o. Tosho Building, 3-2-2, Marunouchi, Chiyoda-Ku, Tokyo.									X			
INDUSTRIAL ELECTRONICS EXHIBITION & AUDIO-VISUAL INDUSTRIAL TRAINING EQUIPMENT SHOW. Tokyo Industrial Center (Ohtemachi Hall), Tokyo. Annual. Contact: Industrial Daily News, 1-8-10 Kudan Kita, Chiyoda-Ku, Tokyo.											X	
MICRO SYSTEM SHOW. Tokyo Ryutsu Center, Tokyo. Annual. Contact: Japan Micro-Photography Association, Kudo Building, 3-5 Kanda-Kaji-cho, Chiyoda-ku, Tokyo.											X	
MICROFILM SYSTEM SHOW. Osaka Merchandise Mart, Osaka. Annual. Contact: Kansai Microphotograph Association, Akashi Building, 106 Shibata-cho, Kita-ku, Osaka.						X						

¹ Frequency undetermined.

NAME OF SHOW AND LOCATION	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
INFORMATION SCIENCE SYMPOSIUM. Tokyo. Annual. Contact: Japan Information Center for Science & Technology, Tokyo.										X		
ANNUAL CONVENTION OF JAPAN SOCIETY OF LIBRARY SCIENCE. Tokyo. Annual. Contact: Japan Society of Library Science, 4-1-1 Shimouma, Setagaya-Ku, Tokyo.										X		
CONGRESS OF INFORMATION PROCESSING SOCIETY OF JAPAN. TOKYO. Annual. Contact: Information Processing Society of Japan, Kikai Shinko Building, 21-1-5 Shibakoen, Minato-Ku, Tokyo.												X
SPAIN												
S.I.M.O.—INTERNATIONAL MONOGRAPHIC GENERAL TRADE FAIR OF OFFICE EQUIPMENT & DATA PROCESSING. (P) Palacio Exposiciones, Madrid. Annual. Contact: C.I.T.E.M.A., Plaza Conde Valle de Suchil 8, Madrid (15).											X	
SWEDEN												
OFFICE DATA '73. AB St. Eriks Fair, Stockholm. Biennial. Contact: Wholesalers Federation LKD Beverantoreningen Kontors-Och Datautrustning, Box 512, 11484 Stockholm.									X			
MICROGRAPHICS—REPROGRAPHICS. U.S. Trade Center. Stockholm.									X			
SWITZERLAND												
B.U.F.A.—OFFICE EQUIPMENT FAIR.** Zuspa Stadthof, 11 Zurich. Biennial. Contact: Schweizerischer Burosachferband, 28 Rudishaldenstrasse, 8800 Thalwil.									X			
GRAPHEX '73. Triennial. Contact: Show Management, Zuspa Thurgauerstrasse 7, 8050 Zurich.					X							
UNITED KINGDOM												
BUSINESS EFFICIENCY EXHIBITION. Olympia Hall, London. Biennial. Contact: Business Equipment Trade Association (BETA), 109 Kingsway, London W.C.2.											X	
COMPUTER PERIPHERAL & SYSTEMS EXHIBITION & CONFERENCE. Metropole, Brighton. Biennial. Contact: BETA, 109 Kingsway, London W.C.2.									X			

(P) Commerce Department Participation is planned.
 **Foreign participation through local agent only.

Global Market Survey Promotional Events Schedule—1974

Micrographics Equipment and Supplies

NAME OF SHOW AND LOCATION	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
AUSTRALIA												
COMPUTERS AND BUSINESS EQUIPMENT., Perth. U.S. Trade Center, Sydney (offsite). Tentative.						X						
BELGIUM												
BUSINESS MACHINE EXPOSITION.** Brussels-Heysel. ¹ Contact: Chambre Syndicale Belge des Fabricants et Agents Generaux de la Mekanographie, 22 Avenue de Stalingrad, 1000 Brussels.									X			
INTERNATIONAL EXHIBITION OF INDUSTRIAL EQUIPMENT. Palais du Centenaire. Biennial. Contact: Palais du Centenaire, B-1020 Brussels.					X							
NEPCON '74—INTERNATIONAL EXHIBITION-CONGRESS OF ELECTRONICS INDUSTRIAL & SCIENTIFIC CONFERENCE MANAGEMENT, INC. Palais du Centenaire, B-1020 Brussels. Contact: Mr. Milton Kiver, 222 West Adams Street, Chicago, Ill. 60606.					X							
12th DIDACTA—EUROPEAN EDUCATIONAL MATERIALS EXHIBITION. Palais du Centenaire, Brussels. Biennial. Contact: Manager, Brussels International Trade Fair, Palais du Centenaire, B-1020 Brussels.						X						
CANADA												
CANADIAN NATIONAL BUSINESS SHOW. Automotive Building, Exhibition Park, Toronto. Annual. Contact: Southam Publishing Company, Grant Smedmore Ltd., 1450 Don Mills Road, Don Mills, Ontario.									X			
CANADIAN COMPUTER SHOW. Sheraton Four-Seasons Hotel 2, Toronto, Ont. Annual. Contact: McLean-Hunter Shows, Industrial & Trade Shows Div., 481 University Ave., Toronto 2, Ontario.									X			
CANADIAN EDUCATION SHOWPLACE. Exhibition Park, Toronto, Ontario. Annual. Contact: McLean-Hunter Shows, Industrial & Trade Shows Div., 481 University Ave., Toronto 2, Ontario.											X	
DENMARK												
INSTITUTIONAL EQUIPMENT TRADE FAIR. Bella Center Exhibition Hall, Copenhagen. Annual. Contact: The Danish Trade Organizations Exhibition Co., Ltd., Bella Center, 64 Hvidkildevej, Dk-2400 Copenhagen NV.	X											

**Foreign participation through local agent only.

¹ Frequency not established.

NAME OF SHOW AND LOCATION	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
PHOTOGRAPHIC EQUIPMENT FOR TECHNICAL APPLICATIONS SHOW. (Tentative) Bella Center, Copenhagen. Contact: Associated Danish Trade Associations, c/o Bella Center Management, 64 Hvidkildevvej, Dk-2400 Copenhagen NV.				X								
FRANCE												
INTERNATIONAL OFFICE MACHINES & DATA PROCESSING EXHIBITION (SICOB). CNIT-LaDefense, Paris, Pateaux. Annual. Contact: Societe Civile Particuliere du Salon des Industries et du Commerce de Bureau, 6 Place de Valois, 75001 Paris.									X			
GERMANY												
10TH OFFICE SUPPLIES EXHIBITION. Frankfurt Fairgrounds. Biennial. Contact: Mess-Und Ausstellungs-GmbH., Postfach 970126, DG Frankfurt Main.											X	
PHOTOKINA. Messegelaende-Koeln. Biennial. Contact: Messe-Und Ausstellung GmbH., Postfach 210760, 5 Koeln 21.									X			
PRINTING AND GRAPHIC ARTS. (Tentative) U.S. Trade Center, Frankfurt.						X						
MODERN OFFICE—OFFICE EQUIPMENT EXHIBITION. Stuttgart. Annual. Contact: Stuttgarter Ausstellungs-GmbH. Am Kochenhof 16, Postfach 990, Stuttgart 7000.									X			
HANNOVER FAIR. Hannover Messegelaende. Annual. Contact: Deutsche Messe-und Austellungs GmbH., D-3000 Hannover-Messegelaende.				X								
ITALY												
BIAS—INTERNATIONAL EXHIBITION ON AUTOMATION & INSTRUMENTATION. Milan Fair Grounds. Biennial. Contact: Studio Barbieri, Viale Premuda 2, 20129 Milan.											X	
SMAU—INTERNATIONAL EXHIBITION FOR OFFICE EQUIPMENT. Fair Grounds. Milan. Annual. Contact: Associazione Nazionale Commercianti in Macchine E Forniture per Ufficio, Corso Venezia 47/49, 20121 Milan.									X			
JAPAN												
BUSINESS SHOW. Harumi Fair Grounds, Tokyo. Semi-annual. Contact: Nippon Office Management Association 4-1-3, Sendagaya, Shibuya-Ku, Tokyo.						X						
BUSINESS SHOW. Minato Fair Grounds, Osaka. Semi-annual. Contact: Nippon Office Management Association, 4-1-3, Sendagaya, Shibuya-Ku, Tokyo.									X			
JAPAN ELECTRONICS SHOW. Harumi Fair Grounds, Tokyo. Contact: Electronic Industries Association of Japan, c/o Tosho Building, 3-2-2, Marunouchi, Chiyoda-Ku, Tokyo.									X			

NAME OF SHOW AND LOCATION	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
INFORMATION SCIENCE SYMPOSIUM. Tokyo. Annual. Contact: Japan Information Center for Science & Technology, Tokyo.										X		
INDUSTRIAL ELECTRONICS EXHIBITION & AUDIO-VISUAL INDUSTRIAL TRAINING EQUIPMENT SHOW. Tokyo Industrial Center (Ohtemachi Hall), Tokyo. Annual. Contact: Industrial Daily News, 1-8-10 Kudan Kita, Chiyoda-Ku, Tokyo.											X	
MICRO SYSTEM SHOW. Tokyo Ryutsu Center, Tokyo. Annual. Contact: Japan Micro-Photography Association, Kudo Building, 3-5 Kanda-Kaji-cho, Chiyoda-Ku, Tokyo.											X	
MICROFILM SYSTEM SHOW. Osaka Merchandise Mart, Osaka. Annual. Contact: Kansai Microphotograph Association, Akashi Building, 106 Shibata-cho, Kita-Ku, Osaka.						X						
ANNUAL CONVENTION OF JAPAN SOCIETY OF LIBRARY SCIENCE, TOKYO. Annual. Contact: Japan Society of Library Science, 4-1-1 Shimouma, Setagaya-Ku, Tokyo.										X		
CONGRESS OF INFORMATION PROCESSING SOCIETY OF JAPAN. Tokyo. Annual. Contact: Information Processing Society of Japan, Kikai Shinko Building, 21-1-5 Shibakoen, Minato-Ku, Tokyo.												X
THE NETHERLANDS												
EFFICIENCY FAIR.** R.A.I. Hall, Amsterdam. Biennial. Contact: VIFKA-Association of Importers & Manufacturers of Business Machines, Nieuwe Parklaan 112, The Hague.										X		
SPAIN												
S.I.M.O.—INTERNATIONAL MONOGRAPHIC GENERAL TRADE FAIR OF OFFICE EQUIPMENT & DATA PROCESSING. Palacio Exposiciones, Madrid. Annual. Contact: C.I.T.E.M.A., Plaza Conde Valle de Suchil 8, Madrid (15).											X	
SWEDEN												
INTERAVISA—INTERNATIONAL TRADE FAIR FOR AUDIO-VISUAL AIDS & SYSTEMS. ¹ Malmo Exhibition Hall, Malmo. Contact: Swedish Audio-Visual Society, Biblioteksgatan 12, 11146 Stockholm.										X		
CONTACT. Svenska Massan, Gothenburg. Biennial. Contact: Graphic Industry Federation. Blasieholmsgatan 4A, 103 27 Stockholm 16, Sweden.											X	
UNITED KINGDOM												
MICROFORUM INTERNATIONAL. The Hilton Hotel, London. Biennial. Contact: Business Equipment Trade Association (BETA), 109 Kingsway, London W.C.2.						X						

**Participation through local agents only.
¹ Frequency undetermined.

Global Market Survey Promotional Events Schedule—1975

Micrographics Equipment and Supplies

NAME OF SHOW AND LOCATION	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
CANADA												
INTERNATIONAL ELECTRICAL, ELECTRONICS CONFERENCE & EXPOSITION. Automotive Building, Exhibition Park, Toronto, Ontario. Biennial. Contact: Southam Publishing Company, Grant Smedmore Ltd., 1450 Don Mills Road, Don Mills, Ontario.									X			
CANADIAN COMPUTER SHOW. Toronto. Annual. Contact: McLean-Hunter Shows, Industrial & Trade Shows Div., 481 University Ave., Toronto 2, Ontario.									X			
CANADIAN EDUCATION SHOWPLACE. Exhibition Park, Toronto, Ontario. Annual. Contact: McLean-Hunter Shows, Industrial & Trade Shows Div., 481 University Avenue, Toronto 2, Ontario.										X		
DENMARK												
INSTITUTIONAL EQUIPMENT TRADE FAIR. Bella Center Exhibition Hall, Copenhagen. Annual. Contact: The Danish Trade Organizations Exhibition Co. Ltd., Bella Center, 64 Hvidkildevvej, Dk-2400 Copenhagen NV.	X											
K'75—INTERNATIONAL OFFICE MACHINE TRADE FAIR** Bella Center Exhibition Hall, Copenhagen. Triennial. Contact: Universal Fair & Exhibition Service Ltd. (U.F.E.-S.A.S.), Vestagevej 5, 2700 Copenhagen O.									X			
ELECTRONICS '75. Bella Center Exhibition Hall, Copenhagen.									X			
FRANCE												
INTERNATIONAL OFFICE MACHINES & DATA PROCESSING EXHIBITION (SICOB) CNIT-La Defense, Paris, Pateaux. Annual. Contact: Societe Civile Particuliere du Salon des Industries et du Commerce de Bureau, 6 Place de Valois, 75001 Paris.									X			
GERMANY												
BURO DATA—OFFICE EQUIPMENT EXHIBITION. Berlin. Annual. Contact: Berliner Ausstellungen, Eigenbetrieb von Berlin, Messedamm 22, 1000 Berlin 19.									X			
SYSTEMS '73. Munich. Biennial. Contact: Messe und Ausstellungsgesellschaft MBH, Theresienhohe 13, 8000 Munchen 12.											X	

**Foreign participation through local agent only.

NAME OF SHOW AND LOCATION	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
HANNOVER FAIR. Hannover Messegelaende. Annual. Contact: Deutsche Messe-und Ausstellungs GmbH., D-3000 Hannover-Messegelaende.				X								
ITALY												
BIAS—INTERNATIONAL EXHIBITION ON AUTOMATION & INSTRUMENTATION. Milan Fair Grounds. Biennial. Contact: Studio Barbieri, Viale Premuda 2, 20129 Milan.											X	
SMAU—INTERNATIONAL EXHIBITION FOR OFFICE EQUIPMENT. Fair Grounds, Milan. Annual. Contact: Associazione Nazionale Commercianti in Macchine E Forniture per Ufficio, Corso Venezia 47/49, 20121 Milan.									X			
JAPAN												
INFORMATION SCIENCE SYMPOSIUM. Tokyo. Annual. Contact: Japan Information Center for Science & Technology, Tokyo.											X	
ANNUAL CONVENTION OF JAPAN SOCIETY OF LIBRARY SCIENCE. Tokyo. Annual. Contact: Japan Society of Library Science, 4-1-1 Shimouma, Setagaya-ku, Tokyo.											X	
CONGRESS OF INFORMATION PROCESSING SOCIETY OF JAPAN. Tokyo. Annual. Contact: Information Processing Society of Japan, Kikai Shinko Building, 21-1-5 Shibakoen, Minato-ku, Tokyo.												X
BUSINESS SHOW. Harumi Fair Grounds, Tokyo. Semi-annual. Contact: Nippon Office Management Association, 4-1-3, Sendagaya, Shibuya-ku, Tokyo.					X							
BUSINESS SHOW. Minato Fair Grounds, Osaka. Semi-annual. Contact: Nippon Office Management Association, 4-1-3, Sendagaya, Shibuya-ku, Tokyo.									X			
JAPAN ELECTRONICS SHOW. Minato Fair Grounds, Osaka. Annual. Contact: Electronic Industries Association of Japan, c/o Tosho Building, 3-2-2, Marunouchi, Chiyoda-ku, Tokyo.									X			
INDUSTRIAL ELECTRONICS EXHIBITION & AUDIO-VISUAL INDUSTRIAL TRAINING EQUIPMENT SHOW. Tokyo Industrial Center (Ohtemachi Hall), Tokyo. Annual. Contact: Industrial Daily News, 1-8-10 Kudan Kita, Chiyoda-Ku, Tokyo.											X	
MICRO SYSTEM SHOW. Tokyo Ryutsu Center, Tokyo. Annual. Contact: Japan Micro-Photography Association, Kudo Building, 3-5 Kanda-Kaji-cho, Chiyoda-Ku, Tokyo.											X	
MICROFILM SYSTEM SHOW. Osaka Merchandise Mart, Osaka. Annual. Contact: Kansai Microphotograph Association, Akashi Building, 106 Shibata-cho, Kita-Ku, Osaka.						X						

NAME OF SHOW AND LOCATION	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
SPAIN												
S.I.M.O.—INTERNATIONAL MONOGRAPHIC GENERAL TRADE FAIR OF OFFICE EQUIPMENT & DATA PROCESSING. Palacio Exposiciones, Madrid. Annual. Contact: C.I.T.E.M.A. Plaza Conde valle de Suchil 8, Madrid (15).											X	
SWITZERLAND												
B.U.F.A.—OFFICE EQUIPMENT "FAIR."** Zuspa Stadhof, 11 Zurich. Biennial. Contact: Schweizerischer Burosachferband, 28 Rudishaldenstrasse, 8800 Thalwil.									X			
UNITED KINGDOM												
BUSINESS EFFICIENCY EXHIBITION. Olympia Hall, London. Biennial. Contact: Business Equipment Trade Association (BETA), 109 Kingsway, London W.C.2.											X	
COMPUTER PERIPHERAL & SYSTEMS EXHIBITION & CONFERENCE. Metropole, Brighton. Biennial. Contact: BETA, 109 Kingsway, London W.C.2.									X			

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